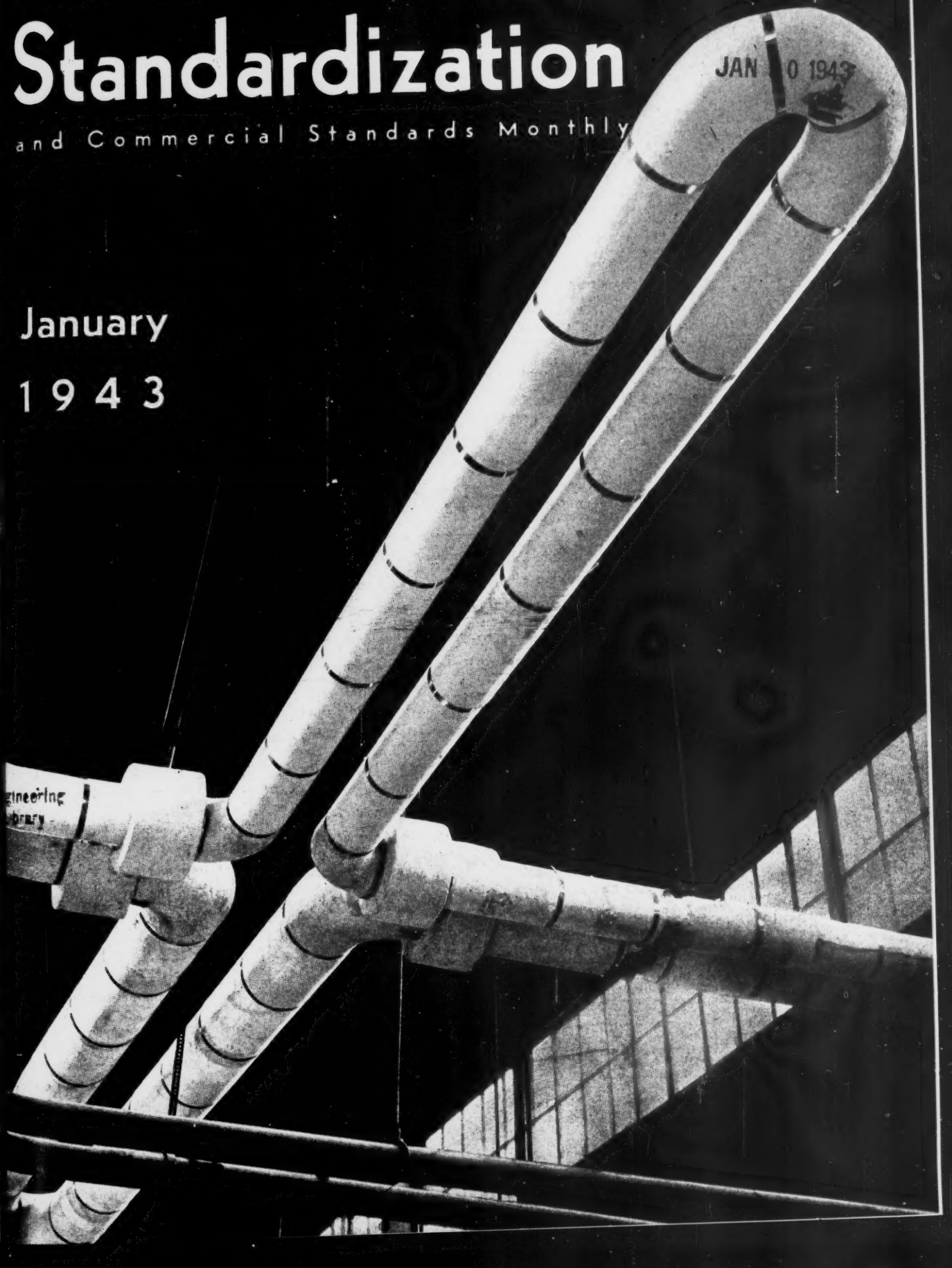
Industrial Standardization

and Commercial Standards Monthly

January

1943



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Am. Institute of Elec Engineers
Am. Institute of Steel Construction
Am. Iron & Steel Institute
Am. Petroleum Institute
Am. Soc of Civil Engineers
Am. Soc of Mechanical Engineers
Am. Soc for Testing Materials
Am. Soc of Tool Engineers
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Mfrs Standardization Soc of the Valve and Fittings Industry
Metal Cutting Tool Institute
Nat Assn of Mutual Casualty Companies
Nat Conservation Bureau
Nat Electrical Mfrs Assn
Nat Machine Tool Builders' Assn
Nat Safety Council
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U.S. Machine Screw Service Bureau

Company Members—Some 2,000 industrial concerns hold membership either directly or by group arrangement through their respective trade associations.

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American Standards Association
29 West 39th Street, New York, N. Y.
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RUTH E. MASON, Editor

Our Front Cover: Requirements for modern power piping are now up-to-date. (See article page 13.)
Photo courtesy National Tube Company.

This Issue

ASA

Reg. in U.S. Pat. Off.

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

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Courtesy National Aircraft Standards

This telling poster is being widely used in war plants throughout the country.

ASA Shows New Record in 1942

Zimmerman Is Re-elected President; Case Is New Vice-President

THE American Standards Association, like many another business organization, has set a new production record for 1942, R. E. Zimmerman, re-elected ASA president, reported at the ASA annual meeting December 11. Two hundred and twenty members of the Association and guests attended the meeting. Work in the past 12 months, all of which has tied in closely with the country's war effort, has resulted in 73 new standards and 49 revisions of existing standards —a completed standard for practically every third day of the year. In addition, the Association completed ten American War Standards, requested specifically by the War Production Board, the Office of Price Administration, or some other governmental agency, Mr. Zimmerman told the meeting. (Mr. Zimmerman's report is given in full on page 2.)

Joseph L. Weiner, new Director of the WPB Office of Civilian Supply, was guest speaker at the meeting. He outlined for members of the ASA how the Government's concentration policy is being followed, why it was adopted, and how it is likely to affect civilian production. (See page 8.)

Dr. H. S. Osborne, chairman of the ASA Standards Council, pointed out the highlights of the ASA work during the past year in his annual report, calling particular attention to the 11 war standards completed during the year. See page 5.)

Both Mr. Zimmerman, president, and Dr. Osborne, chairman of the Standards Council, were re-elected to serve new terms. This will be Mr. Zimmerman's third term as president. George S. Case, chairman of the Board, Lamson and Sessions Company, was elected vice-president, and E. C. Crittenden, assistant director, National Bureau of Standards, vice-chairman of the Standards Council.

Zimmerman's Third Term

Mr. Zimmerman, who is vice-president in charge of metallurgy and research of the U. S. Steel Corporation, has been active in the work of the ASA since 1937. At that time he was elected to membership on the ASA Board of Directors as a nominee of the American Iron and Steel Institute. The Institute became a Member-Body of the ASA in 1934, and a group member in 1935.

Mr. Case, new ASA vice-president, has been a member of the ASA Board of Directors since 1939, representing the American Institute of Bolt, Nut and Rivet Manufacturers. He has also been active in the technical work of the Association as an alternate member of the ASA Standards Council, and as a member of several sectional committees.

Osborne Re-elected

Dr. Osborne, re-elected chairman of the ASA Standards Council, is one of the pioneer workers in the American Standards Association. He has been a member of the Council since 1923, representing the American Institute of Electrical Engineers. He served as vice-chairman of the Council from 1940 through 1941, and was elected chairman at the Annual Meeting in December, 1941. Dr. Osborne has just been promoted from Plant Engineer of the American Telephone and Telegraph Company to Assistant Chief Engineer.

Mr. Crittenden, new vice-chairman of the Standards Council, is chief of the Electrical Section of the National Bureau of Standards as well as assistant director. He has been a member of the Standards Council since 1925, and has also been active in the work of the ASA Electrical Standards Committee and in the United States National Committee of the International Electrotechnical Commission. He is a member of several of the sectional committees working on electrical standards problems.

It was announced at the meeting that the following five organizations were elected to nominate members of the ASA Board of Directors to fill vacancies occurring this year: American Petroleum Institute, American Gas Association, ASA Fire Protection Group, Association of American Railroads, American Institute of Electrical Engineers.

At the ASA Annual Meeting:—(L. to R.) R. E. Wilson, Pan-American Petroleum and Transport Company; Joseph L. Weiner, Director WPB Office of Civilian Supply; R. E. Zimmerman, ASA President; Henry B. Bryans, Philadelphia Electric Company; and H. S. Osborne, Chairman ASA Standards Council.

Standards to the Fore In War Production

Annual Report

by R. E. Zimmerman[1]

President, American Standards Association

IN PERIODS of great national stress, matters of fundamental importance come to the fore and stand out in great clarity. The present conflict in which we are engaged has brought standards to the public mind as never before.

It is no accident that Honorable James F. Byrnes, Director of Economic Stabilization, has put standards and simplification in the forefront of his program. Rather, it is significant that in directives to the War Production Board, to the Office of Civilian Supply, and to the Director of the Budget, Justice Byrnes has asked for an intensive program on standards and simplification to speed production for war purposes; to keep down costs and thus relieve the pressure on the Treasury; and to "guarantee our people the basic living essentials that they must have at prices that they can pay."

Last year we met in this room just three days after Pearl Harbor. Those of you who were here at that time will remember our discussing the possible part which the American Standards Association might play in the coming months. The launching of a great coordinated national effort was destined to call upon standards in proportion to the enormity of the task ahead. At no other time in its existence had this organization been confronted with such opportunities for service, nor had it faced such responsibilities.

It is the privilege and duty of the President on this occasion to report to you something of how we are living up to those responsibilities. Already much has been accomplished. American Standards and American War Standards are in wide use by the Army and the Navy, by prime contractors and sub-contractors. The work of ASA Committees is being written into orders of the War Production Board and of the Office of Price Administration.

An ever-increasing regard for standards has been developing in Government agencies and in business circles. In a recent talk, a high-ranking official told us that one of the major difficulties which the American Army has been encountering abroad is the lack of thoroughly standardized parts for repair work. There has been the further complication of coordination with the British and our other allies on the dovetailing of supplies.

[1] Vice-president, U. S. Steel Corporation.

Mr. Bernard Baruch recently predicted that standards and simplification would constitute the most important activity of the War Production Board and I think his statement is coming true.

Most of you know of the Government contract consummated a few months ago by and between the Office of Emergency Management and the American Standards Association. Under this contract the ASA is doing a great many emergency jobs for the War Production Board and the Office of Price Administration. The contract provides for reimbursement for expenditures up to a total of $90,000 a year. It does not cover the large amount of work which is being done for the Army, the Navy, or other departments of the Government.

Some months ago the Navy asked for a simple, inexpensive device to aid its photographers in finding the correct photographic exposure for any time of day in any part of the world. Within a comparatively short period, through the cooperation of the whole photographic industry, we had the project completed for them—a standard photographic computer which is now being used on every ship in the Navy and on every Army and Navy plane which is equipped for photographic work.

Practically ready for publication is a standard for men's safety shoes which will save valuable war material and at the same time protect the worker against injuries which might keep him from his job at a time when his services are vital to production schedules.*

Also nearly completed is a standard for the protective lighting of industrial properties. This will aid in safeguarding our factories from theft, sabotage, and subversive activities of all kinds.*

A comprehensive program of standards for materials and parts for military radio is, for the first time, unifying the requirements of Army, Navy, prime contractors, and sub-contractors. This activity is ironing out a great many kinks in production and in procurement. It is expediting the entire process of radio production. Companies entering this field for the first time are doing their tooling up on the basis of these standards.

A drastic simplification program for repair parts for civilian radio is also being started. This will insure the "home" radios of our country being kept in good working order. Features of construction, definitions of quality and operating performance, set up under this program, will enable OPA satisfactorily to relate quality to price in future price orders.

These are some of the specific jobs the American Standards Association is doing to assist in war production. Much of the peacetime work of the Association, of course, was immediately available for the war effort; for example, the more than 80 mechanical standards for parts, tools, bolts, screws, bearings, drawings were ready for instant use. The 70 safety standards for the protection of workers from industrial accidents, the many electrical standards for motors, wires and cables, insulators, switchgear, and so forth, were available at once for Government purchasing and for arrangements with sub-contractors.

* This standard has now been approved and published.

G. S. Case

E. C. Crittenden

Immediately after Pearl Harbor, the American Standards Association began to increase its services to Government Departments and to industry. It has been able to assist the War Department in setting up its safety program in industry by supplying hundreds of safety standards to Government arsenals and to companies filling Government contracts. At the request of the Committee on Conservation of Manpower, the ASA has printed a special group of safety standards and made them available, at cost, to students in Government-supervised safety engineering courses. Numerous requests have been received for information and these have been handled by the staff or turned over to technical committees. Some of this work has been just as important to the war effort as the development of new standards.

Calls on the ASA Library for standards and specifications to be used in filling orders have doubled and redoubled in these months. The number of standards purchased is three times the volume of any other year.

These activities, which are illustrative, and many others unmentioned, have not been prosecuted without an immense amount of good hard work. There have been many days spent in consultation with Government officials in Washington. To meet the increased demands we have had to increase the staff by more than 50 per cent since we met last year. For your information, the staff now numbers over 50.

Increases in Work Raises Financial Problems

With these increases in the work there have come, as might be expected, some additional financial problems. They have been partly offset, it is true, by an unprecedented number of new company members. We are glad to report that during the summer months 50 new companies joined. That is a step in the right direction, but is far short of the number deriving direct benefits from the work of standardization. The roster of this Association should include, either directly or indirectly, the names of all the major industrial concerns in the country.

To spend the few more moments on the subject of membership—during this year four new national groups have joined the ASA:

Metal Cutting Tool Institute

Timber Engineering Company (a subsidiary of the National Lumber Manufacturers Association).

Textile Color Card Association.

Committee on Consumer Relations in Advertising.

The interest of the Metal Cutting Tool Institute in present ASA work is obvious.

We are glad to have the Lumber Manufacturers join because of the wide program of standardization in the building field, including building codes, and the interest in prefabrication and standardized units for post-war building.

The affiliation of the Committee on Consumer Relations in Advertising, which is a coordinating agency in the advertising field, brings into the Association an industry which has never before been represented in the ASA federation. We believe that this membership is significant of the attitude of business toward the question of standards for consumer goods and toward the consumer movement in general. Scarcity of materials and of production facilities has brought an increasing stringency in the field of consumer goods. Director Byrnes' announcement of a few weeks ago recognized that, in this "tight situation", the public must be protected by standards. The membership of this advertising group is a particularly happy move, coming as it does at this time, because it shows the interest of the advertising profession in consumer standards. It will make available, for the benefit of all concerned, their experience and knowledge in the development of such standards.

Textile Color Card Association New Member

The Textile Color Card Association membership also represents a new group deeply interested in the standardization of color and ready, we believe, to calibrate their own widely used series of color cards so that they may be measured in terms of the new scientific color standard.

In another direction, it is gratifying to be able to announce that means have been found whereby the Association is undertaking an extensive program of cooperation on standardization work with the other American countries. This is both fortunate and timely. With the rapid industrial development now taking place in many of the other American republics, standardization is really striking roots. National standardizing bodies are now in operation in Argentina, Brazil, and Uruguay, and one is in process of formation in Chile. One of the departments of the Republic of Mexico has for several years been affiliated with the American Standards Association.

Everyone feels that there must be the closest possible cooperation between this country and the other American countries, so that their national standards may be as much alike as possible.

Full-Time Representative in South America

We now have a full-time field representative in South America. On December 1st Mr. Cyrus T. Brady, a graduate engineer who has been the Argentine representative of a large American industrial concern since 1915, undertook this important work. His company has given him a year's leave of absence for the purpose. Mr. Brady's work is supported by a technical staff in the New York office. Mr. Rodriguez, who has for

years conducted an export business in the machinery field between this country and Spain and Portugal, will have charge of the work in the home headquarters.

This program is destined to play an important role in fostering Inter-American trade and in bringing about better and closer relations between all of the American republics.

Work of Permanent Value

I have spent most of the time alloted to me today discussing ASA contributions to the war effort. A few statements may properly be aimed at the period of peace which will come in due time. Much of the work which we have carried through under pressure in these last 12 months will be of permanent value. Our Building Code committees are already opening the way for more efficient and economical homes for the future. Much of the standardization work in the mechanical field will, no doubt, be translated into more and better products for peace-time consumption. And in the consumer field, we believe that the standardization program which we are now just starting, will be broadened to something bigger than the Association has ever done and something that will be of lasting benefit to the whole country. In all of the current activities of the ASA, regular and special, you will find a determined effort to lay firm foundations for the post-war period. Victory is the first objective—there is no middle ground. Victory is the last.

American War Standards for 1942

Straight Screw Threads for High-Temperature Bolting (B1.4-1942)

Code for Electricity Meters (Revision of Paragraph 827) (C12WS-1942)

Machine Tool Electrical Standards (C74-1942)

Fixed Mica-Dielectric Capacitors (C75.3-1942)

Control Chart Method of Controlling Quality During Production (Z1.3-1942)

Approval Requirements for Domestic Gas Ranges (Z21.1ES-1942)

Approval Requirements for Gas Water Heaters (Z21.10WS-1942)

Allowable Concentration of Manganese (Z37.6-1942)

Photographic Exposure Computer (Z38.2.2-1942)

Specification and Description of Color (Z44-1942)

Protective Lighting of Industrial Properties (A85-1942)

War Standards Important In 1942 Work of ASA

Annual Report

by H. S. Osborne

Chairman, ASA Standards Council

DURING the past year the emphasis in the work of the Standards Council has been on standards immediately helpful in connection with the war. For this, frequent use has been made of the emergency routine established by the ASA in 1941. Our year's experience with this emergency procedure has proven its suitability for the purpose intended, namely, expediting the process of making standards urgently needed for the war available for use.

During the year 17 projects were initiated under this routine as shown in the box on page 6. Of these, 13 were requested by or initiated with the express approval of the War Production Board, the Office of Price Administration, the War Department, or the Navy.

Eleven war standards were approved under the emergency procedure. These are shown in the box above.

These war standards and war standard projects are needed for a wide variety of purposes:

1. The photographic exposure computer was for the direct use of the Army and Navy. The purpose of this computer is to provide a simple

but accurate method of determining the various factors that enter into taking a picture, thus enabling the photographer to determine exposure time and camera lens opening without the use of an exposure meter.

2. Some of the war standards are for the protection of workers. Examples of these are standards for the allowable concentration of manganese, standards for goggles, respiratory equipment, and safety shoes.

3. Other standards are for the protection of consumers to ensure that limitation of materials and price limitations will not result in unnecessary quality degradation. This type of standard is represented by standards for domestic gas ranges and gas water heaters, and standards for the fastness of colored textiles.

4. Standards to ensure safety and to conserve material are illustrated by standards for steel pipe flanges, fittings, and the rerating of these when corroded.

War Projects Initiated During 1942 Under Emergency Routine

Protective Lighting of Industrial Properties (A85)

Cast-Iron Pipe Flanges and Flanged Fittings, Class 125 (B16aWS)

Threading of General-Purpose Bolts and Nuts (B1sub)

Electrical Measuring Instruments (C39)

Military Radio Equipment and Parts (C75)

Color Fastness of Textiles, Terminology (L14)

Standardization and Simplification of Goggles and Respiratory Equipment (Z2WS)

Approval Requirements for Domestic Gas Ranges (Z21.1ES)

Approval Requirements for Gas Water Heaters (Z21.10WS)

Photographic Exposure Computer (Z38.2.2)

Specifications for Men's Safety Shoes (Z41.1)

Packages for Electronic Tubes (Z45)

Color Code for Lubricants for Machinery (Z47)

Code for Electricity Meters (C12WS)

Sizes of Children's Garments (L11)

Replacement Parts for Civilian Radio

Welding Arc Hand Shields and Helmets

5. The standard for the protective lighting of industrial plants represents another type of purpose.

6. Finally, a large group of standards are designed primarily to promote conservation of materials or increased production, or both. Such standards include standards for radio equipment and parts, packages for electronic tubes, standards for graphical symbols in various fields, and machine tool electrical standards. A revision of the code for electricity meters designed to conserve manpower may be included in this classification.

Quality Control of Special Interest

Of particular interest is a series of standards for the control of quality during production, one of which was completed during the year. This standard shows the manufacturer how to keep track of the accuracy of his production process by means of a quality control chart and from the results of current tests of relatively small samples determine whether things are running smoothly or whether he should be on the lookout for trouble in the production process.

While it is natural to put particular emphasis on war emergency standards, these are only a part of the contribution made to the war effort by the Standards Council during the past year. In addition to the war standards mentioned, some 132 other regular standards were approved, including 74 new standards and 58 revisions. These constitute a record-breaking activity volunteered by men most of whom are already heavily engrossed in war work. This large volume of work was done because the standards are of help in the war effort. The regular standards approved during the year may be divided into the following eight general categories:

	No.
1. Specifications for Iron and Steel for Various Uses	39
2. Specifications for Building Materials	13
3. Methods of Test	23
4. Simplification and Interchangeability of Mechanical Parts	16
5. Specifications or Ratings for Electrical Equipment	15
6. Public Health or Safety	11
7. Symbols and Definitions	7
8. Miscellaneous	8

A large proportion of these standards are of direct aid in war production. This is perhaps particularly evident as regards the first five groups which include a large number of specifications and standards for materials, mechanical parts, and apparatus used in the construction of war plants and in the production of war materials. Those dealing with public health or safety, illustrated by Specifications for Drinking Fountains, are also important from the standpoint of production. Symbols and Definitions also have many applications, for example, the new standard symbols for telephone, telegraph, and radio use were

immediately put into use by the Signal Corps. The Miscellaneous group includes Standards for Industrial Lighting whose application to production is obvious.

It is of interest that a new record was made in 1942 not only in the number of standards and revisions adopted but also in the number of projects initiated under the regular procedure in addition to those under the war emergency procedure. These new regular projects are 34 in number. The reasons for initiating so many new projects in war time is clear when it is noted that these projects are almost wholly specifications for iron and steel for various applications, castings, plates for various purposes, structural steel, rivets, etc.

In the above, reference is made only to work which has come before the Standards Council during the year. In addition, the Member Bodies of the American Standards Association and the organizations cooperating in ASA sectional committees have done a vast amount of work, some of which has not yet come to the Standards Council and some of which is not directed toward the production of American Standards, but which nevertheless adds greatly to the contribution which standardization is making toward the war effort. The staff of the ASA have also done a large amount of work in cooperation with the various war agencies to the same end.

In spite of the very heavy program of work during the year the Council found it possible by unanimous consent to eliminate one of the three scheduled meetings, making in this way a contribution to the conservation of transportation and the time of very busy men.

I know that the entire Council joins with me in expressing appreciation to the tireless and devoted staff of the ASA for their unceasing work and for the devoted volunteer work of the thousands of busy men who constitute the Sectional Committees and Correlating Committees by which the standards are formulated.

Coonley Heads Reorganized Conservation Division of WPB

THE Conservation Division of the War Production Board has been entirely reorganized to give the work on simplification and standardization a more important position in the WPB set-up. Howard Coonley, former Deputy Director, becomes Director of the reorganized division, which now includes the Branches on Simplification, Specifications, and Substitution.

The Salvage Branches, formerly in the Conservation Division, have been organized into a separate division under Paul C. Cabot, who has headed that work from the beginning.

The announcement of these changes was made at a dinner given to Lessing J. Rosenwald, retiring head of the division, on December 13.

In the WPB set-up the Conservation Division is one of the Resources Agencies, which head up under Ernest Kanzler, Director General of Operations.

The Division itself is organized as follows:

Director:—Howard Coonley

Deputy Director:—Harvey A. Anderson

Specifications Branch:—C. L. Warwick, Chief
Blodgett Sage, Deputy Chief

Simplification Branch:—R. B. Shepard, Chief
A. M. Houser, Deputy Chief

Conservation and Substitution Branch:—
Harvey Anderson, Chief

Mr. Coonley is chairman of the Advisory Committee of the American Standards Association. He served as ASA president from 1933 through 1935. He is chairman of the Board of the Walworth Company, and for many years has been president of the Manufacturers Standardization Society of the Valve and Fittings Industry. He is a past-president of the National Association of Manufacturers.

Articles on Standards By ASA Staff Members

Articles about standardization by staff members of the American Standards Association have been published recently or are scheduled for publication as follows:

P. G. Agnew, Secretary—

"Use of Standards Helps to Win the War," *New York Times*, January 3, 1943

"Normalizacion es Dinamismo—Su Importancia en la Economia de las Americas," *Veritas*, Buenos Aires, March 31 Special Number

John Gaillard, Mechanical Engineer—

"Preferred Numbers, Prefernograph Simplify Products Standardization," *Product Engineering*, November, 1942.

"Refined Quality Control Speeds Up Production," *American Machinist*, December 10 and 24, 1942.

The Why and How of the WPB Concentration Program

by Joseph L. Weiner

Director, Office of Civilian Supply, War Production Board

Surveys are now nearing completion to determine which industries can best serve the nation if they are concentrated, Mr. Weiner tells ASA Annual Meeting. Production of essential civilian supplies is main goal

AS a group you have through this organization manifested your interest in the goods available for our civilian life. I want to tell you, in bare outline, how the concentration of production policy announced by the War Production Board is being followed, why it was adopted, and how it is likely to affect civilian production.

In the first place, concentration of production where it will increase our war potential has been adopted as a policy by the War Production Board. We are now bringing to a close preliminary surveys of industries which seem to be capable of contributing to the war program if they are concentrated. As these surveys become available, the War Production Board will decide whether the information calls for concentration in the national war interest. Where concentration seems desirable detailed programs will be developed which will lead to the selection of firms for continued production. Consultations with those interested, both management and labor, is specifically provided for.

OWI Photo

Joseph L. Weiner

People ask which industries will be concentrated. We keep no list of industries nor do we know how many plants will be affected by concentration. Industries will be concentrated only when the war situation calls for it.

Essentially, the production of civilian-type goods is concentrated to insure the continued production of goods that are essential even in wartime, and also to insure that these goods are produced at the minimum of cost to the war program. As an increasing proportion of our economic resources are diverted to war, the quantity and variety of many civilian goods must inevitably be reduced. Up to the present time, civilian sacrifices have been made largely because of materials shortages. Shortages of shipping have made it necessary to give up imported commodities like coffee and sugar. Shortage of shipping combined with the loss of territory to the enemy has required the most stringent economies in the use of rubber. The crude rubber available for civilian uses (including medical and drug supplies and food preservation) in 1943 will be only about six percent of the amount available for these uses in 1940.

But far greater curtailments have been made

in the civilian use of metals. It is now estimated that only 1½ per cent of the total steel expected to be produced in 1943 will go into consumer products. Practically all of that will be required for the maintenance of houses and durable goods already produced and in use. Similar curtailments are necessary in the usage of other metals. For instance, in 1943, the usage of copper for consumers' goods will be only about seven per cent of the amount used for similar goods in 1940. There will be practically no high-grade aluminum available for American civilian consumers next year.

Greater Sacrifices Required

Between these drastic curtailments in the use of metals and sacrifices by civilians there has been a comfortable cushion in the form of inventories in the hands of distributors. This cushion, however, will give less and less comfort during the coming year. But consumers also have a very large inventory of many durable goods. The continued use of these goods can be fostered by the maintenance of supplies of parts for repair, and materials for maintenance. Thus, although the war is being fought largely with metal, actual sacrifices by consumers has hitherto been small. It will necessarily rise in the future.

Restrictions on civilians will widen during the coming year. Armies in active combat are voracious consumers of material. When they succeed in advancing they open up territory which is likely to be desperately in need of the essentials of life. In consequence, export demands, particularly for food and clothing, are likely to increase.

Less Labor for Civilian Production

There is another direction from which increased curtailment is likely to come. The armed forces will need more men in 1943. They will also need more equipment. Some of this, but only some, will come from better distribution of scarce materials and better utilization of manpower. These increases in the need for exports, combined with the need to divert more men into the armed forces or war production, mean that there will be less labor available for civilian production. We must of course offset this shortage as far as we possibly can by attracting into active production older people, women, and groups whose capacities have not been fully used in the past because of discrimination against them. But it is clear that we must look to 1943 as a year in which we must make the most economical use of scarce labor.

This intensification of the war program will mean also a shortage of other resources which in varying degree affect almost all economic activity, such as transportation, power, and storage facilities. For instance, if we endeavor to transport all the people and goods likely to be offered to the railroads, we must supply them with large quantities of additional rolling stock. If we supply this rolling stock, we take both metals and productive facilities away from the war program. The scarcity of rubber, which is too well-known to need emphasis, means that we cannot divert transportation from the railroads to the roads. In fact, the diversion must be from the roads to the railroads. In some parts of the country, the difficulty of transporting petroleum products would require economy in the use of road transport even if the shortage of rubber were less serious.

Courtesy Wheeling Steel Corp.

The old-fashioned coal stove assumes a new importance in the Office of Civilian Supply's concentration of industry program.

These steadily diminishing supplies of most of the things necessary to produce civilian goods present us with three major questions. How far can civilian production be reduced? How far should it be reduced in the near future? How can we arrange that essential civilian supplies will be produced?

To Assure Essential Civilian Supplies

Concentration of production deals, of course, only with the last of these questions. Concentration may be necessary because the essential civilian supply is so small a proportion of the capacity of an industry that if the production were shared out among all the plants within the industry according to their past business, none could be kept going. In these circumstances essential civilian supplies can be maintained only by the concentration of their production in a few plants. In other words, civilian production may be curtailed so severely by the war program that we must attempt to insure continued production of essential civilian supplies by concentrating

the limited amount of business in a few plants which can operate at a rate sufficient to keep in business.

Stove Production Concentrated

Perhaps I can make this picture a little more realistic by taking one example and describing what was done. Provision was made for the concentration of the production of cooking and heating stoves in May 1942. It was then clear that the amount of metal available was not sufficient to enable all the plants to operate. If all stove producers had been curtailed uniformly, each manufacturer would have been able to use no more than 25 percent as much steel as in the year ending June 30, 1941. Not many firms could exist at that restricted rate of operation. The War Production Board therefore decided to concentrate so that designated plants would be able to produce more stoves and insure the necessary civilian supplies. Many of the plants were operating in areas where munitions plants were in need of additional labor. Moreover, it appeared that many of the stove plants could turn to war work. In consequence, an order was issued which excluded large firms from production and also small plants located in areas where labor was already scarce or was expected to become scarce shortly. As a result of this order, almost 25,000 workers were released, mostly in the areas in which they were needed for war production. Most of the large plants no longer allowed to make stoves have taken war contracts.

Even so, the manufacturers allowed to continue making stoves have encountered a number of difficulties. Some were unable to obtain adequate supplies of materials, largely due to the fact that our control of the flow of scarce materials is still far from perfect. As you undoubtedly know, however, an improved control—the Controlled Materials Plan—is now being established. Furthermore, in order to reduce the consumption of metal by the industry, firms had been required to produce a simplified and lighter product. Some plants encountered difficulties in adapting themselves to the new simplified models. Some manufacturers were not able to produce the particular kind of stove required by the armed forces.

Armed Services Need More Stoves

But this was not all. The armed services have found it necessary to order stoves in considerably greater quantities than were expected at the time the concentration of production was ordered. Similarly, events have necessitated an increase in the supply for civilians. The expedition into North Africa has, of course, required tremendous quantities of oil. The burden of supplying this oil has fallen most heavily upon the Atlantic Seaboard where there was already a shortage owing to the difficulties of transportation. This shortage is due largely to the severe restriction of coastwise tanker shipments and to the limited capacity of pipelines and railroad tank cars. In consequence, increased quantities of coal and wood burning cooking and heating stoves have been needed to take the place of gas and oil heating equipment which can no longer be supplied with fuel in the necessary quantities.

300,000 Additional Stoves Authorized

The Office of Civilian Supply has initiated various steps which have been taken to deal with these difficulties. Stove manufacturers have been given a sufficiently high priority rating to enable them to obtain materials. They have also been authorized to make some 300,000 additional coal and wood-burning heating stoves during the coming winter months. They have been permitted to produce these stoves with their old patterns so as to avoid any shortage of stoves resulting from inability or delay of manufacturers to produce the simplified model. The armed forces have agreed to release for civilian use 15,000 stoves now ready for shipment and an additional 85,000 stoves under order for the Army and Treasury and to be produced during the winter. To insure that these stoves go mainly to the areas where they are most needed, and to the persons who most need them, the Office of Price Administration has been requested to control their distribution by rationing. Many of these steps taken to relieve the present emergency in the Northeastern states have been possible only because sufficient plants were left open to provide for the production of stoves in excess of the quantities originally set should the need present itself as, in fact, it has.

Industries Need Assistance

Looking back over the experience with the stove concentration, I would draw two major conclusions. Firstly, some industries that are concentrated will need assistance to avoid delay in adapting themselves to the concentration. This delay may mean failure to produce essential civilian goods. Secondly, when production is concentrated, a sufficient cushion of unused capacity must be provided to allow not only for mistakes that are inevitable but also for unforeseen turns which the war will take.

The need for the concentration of production appears, therefore, whenever war eats deeply into the economy. The diversion of our resources to increasing military production takes place not only in the field of materials but also in manpower, transportation, fuel, power, and other facilities. Inevitably, when a large part of our resources are turned toward war, steps are necessary to see that essential civilian needs are met,

and these cannot be met by plants using only a small fraction of their capacity.

How to Produce for Civilians

In order to maximize our war potential we must fit the essential civilian production into the war economy so that there is a minimum of competition between the direct needs of war and those indirect needs of war which we call essential civilian requirements. We now face the question whether we cannot minimize the drain on our resources necessary to produce essential civilian supplies. This can often be done where the output of necessary civilian goods is less than the capacity to produce them. We can then close down production in areas where labor, power, and transportation are scarce and transfer civilian production to areas where it conflicts less with the war program. This policy is the foundation of the concentration program which has been announced. There is no need for me to point out that the application of the policy is often very difficult. In moving production to points where there is more available labor, one may move away from important markets and thus increase the transportation burden. The only simple guide to be followed is that of relieving the narrowest bottlenecks.

There are two other equally important considerations, however, in the concentration programs. Wherever possible the plants withdrawn from civilian production will be those most adaptable to war production. Very often the larger plants, because of their better equipment, and particularly their more highly skilled management, can best turn to war work. Furthermore, the War Production Board is required, under the Smaller War Plants Act, to use its power to direct the flow of scarce materials so as to make the greatest possible use of small plants in the production of both war material and essential civilian production.

I am sure that you were particularly interested in my reference to simplified stove models. It is our policy to inquire into the standardization and simplification of products made by industries subject to concentration. And we are fortunate, indeed, in having your former president and my good friend, Mr. Howard Coonley, so active with us in this field.

Sacrifices Necessary

There is no need for me to say that the concentration programs will be difficult to carry into effective operation or that it calls for sacrifices from individuals. Workers must often give up their customary jobs and turn to something quite different. Businessmen must face a temporary cessation of business unless they can participate in the war program. But no one will deny that such sacrifices are necessary, or even that they are small in relation to the alternatives, namely a long war which will drain away our economic vitality or a defeat of the ideals which make up the spirit of this country.

Westman Joins ASA Staff

Harold P. Westman, formerly secretary of the Institute of Radio Engineers, has joined the staff of the American Standards Association to spend full time on the work on War Standards for Radio.

Mr. Westman has had a long association with the Institute of Radio Engineers, having first gone with the Institute as assistant secretary in July 1929, and becoming full secretary in February 1930. Throughout these fourteen years he has been active in the standardization program of the Institute; and when the war work on Radio Standards was started early last year at the request of the War Production Board, the U. S. Army, and the Navy, Mr. Westman was loaned to the ASA by the Institute on a part-time basis. Mr. Westman has now resigned his position as IRE secretary to give full time to this war work of the ASA.

Turpin Loaned by War Department

The War Standards work on Radio is also being forwarded through the services of H. J. Turpin who has been detailed from the Fort Monmouth Laboratory of the Signal Corps to work on the Military Radio project in the ASA office for a 90-day period.

48 Companies Become New ASA Members

Increased interest in standards on the part of industry during the past year and in connection with war production is reflected in the affiliation of many new companies with the American Standards Association. Forty-eight organizations became new Company Members of the ASA during the last six months. These organizations are:

Acme Industrial Company
Aircraft Screw Products Company
Alloy Steel Products Company
American Foundry Equipment Company
American Laundry Machinery Company
American Screw Company
Atlantic Refining Company

Bucyrus-Erie Company

Comas Cigarette Machine Company
Continental Screw Company
Crescent Company

Electric Advisors, Inc.

Fisher Governor Company
Forest Products Treating Co.
Frank Adam Electric Company
Frederick Iron & Steel Co.

Gas Advisers, Inc.
Geiger Iron Works, Inc.
Globe-Union, Inc.

H. M. Harper Company
Hygrade Sylvania Corporation, Radio Tube Division

Interchemical Corporation

The LaBour Company, Inc.
Lamson & Sessions Company
Lauer Tool and Gauge Company
Lehigh Safety Shoe Company
Lyon Metal Products, Inc.

P. R. Mallory & Company, Inc.
Mills Novelty Company
Morey Machinery Company, Inc.
Morgan Construction Co.
Morgan Machine Co.

Norris Stamping and Manufacturing Company

Ohio Nut and Bolt Company
Ohmite Mfg. Co.
Orr & Sembower, Inc.

Peck, Stow & Wilcox Company
Petroleum Advisers, Inc.
Pittsburgh Equitable Meter Co.

Republic Flow Meters Company
Rochester Telephone Corporation

Safety Research Institute
Shakespeare Products Company
The Sharples Corporation
Standard Pressed Steel Company
Stephens-Adamson Manufacturing Company
Stonehouse Signs, Inc.
Stow Manufacturing Company

Taylor-Colquitt Company
Timber Engineering Company
Tobe Deutschmann Corporation

Universal Sanitary Manufacturing Company
University of Texas

Valve Pilot Corporation

Washington State Department of Labor
Wilcox, Crittenden and Company
The William Hood Dunwoody Industrial Institute

As ASA members these companies will receive copies of the ASA monthly magazine, free copies of newly published standards, use of the library and information service, direct and authoritative information about all standardization projects in which they are interested in all stages of their development.

One of the purposes for which the American Standards Association was organized is to bring the economies of standardization on a national scale to the individual company. This is particularly valuable now in view of the importance of standards in the whole war production set-up.

Swiss Standards Association Acts as ISA Custodian

As a result of the international situation, the secretariat of the International Standards Association is being taken over temporarily by the Swiss national standardization body. In connection with this move, Senator Giovanni Tofani, of Italy, president of the ISA, reports:

"Every possible effort having been made to maintain the ISA in these times of political difficulties it must be concluded that it is impossible to meet the expenses of a secretariat while no subscriptions of the standardizing associations are obtainable."

The Swiss association will store the records of the ISA and will keep up all indispensable correspondence in order that the ISA can continue to exist. Headquarters of the ISA have been transferred to Zurich.

ASA Appoints War Committee On Acme Screw Threads for Aircraft

An ASA War Committee to develop War Standards on Acme Screw Threads for Aircraft has just been appointed by the American Standards Association. Nominal and limiting dimensions of Acme screw threads intended primarily for translating screws used in aircraft will be covered by the work of this committee.

Professor Earle Buckingham, of the Massachusetts Institute of Technology, is chairman of the War Committee. The other members are: C. M. Pond, Pratt and Whitney Division, Niles-Bement-Pond Company; C. A. Reimschissel, Landis Machine Company; W. M. Smith, Bell Aircraft Corporation; and F. E. Richardson, Working Committee of the Aeronautical Board.

The War Standard was requested by the National Aircraft Standards Committee.

New Code for Pressure Piping Brings Safety Requirements Up-to-Date

New edition includes refrigeration piping and recognizes advances in use of welding

by Sabin Crocker[1]

Chairman, Subcommittee on Plan, Scope, and Editing, ASA Sectional Committee on Code for Pressure Piping (B31)

UP-TO-DATE safety requirements for piping used in high-pressure installations, such as piping systems for power, for gas and air, oil, district heating, and refrigeration, have just been completed in the new edition of the Code for Pressure Piping. The Code, which was issued in 1935 as American Tentative Standard, has been revised to take care of the developments in piping practice which have taken place since that time. It has now been approved by the American Standards Association as American Standard.

The many advances in piping practice which have taken place since 1935 make the new edition particularly worthy of consideration by those concerned with the safe installation of pressure piping systems. During the past six years, welded joints have become increasingly important; standard dimensions for various types of fittings have been established and have come into common use; new rules and qualification tests for welding have been formulated; and a section on refrigeration piping was found to be necessary because of the growth of air conditioning as well as of the older refrigeration applications. In addition, temperatures and pressures have been advanced to new high points. Requirements to cover all these changes, as well as additional new material, have been incorporated in this new edition of the code.

Minimum Safety Requirements

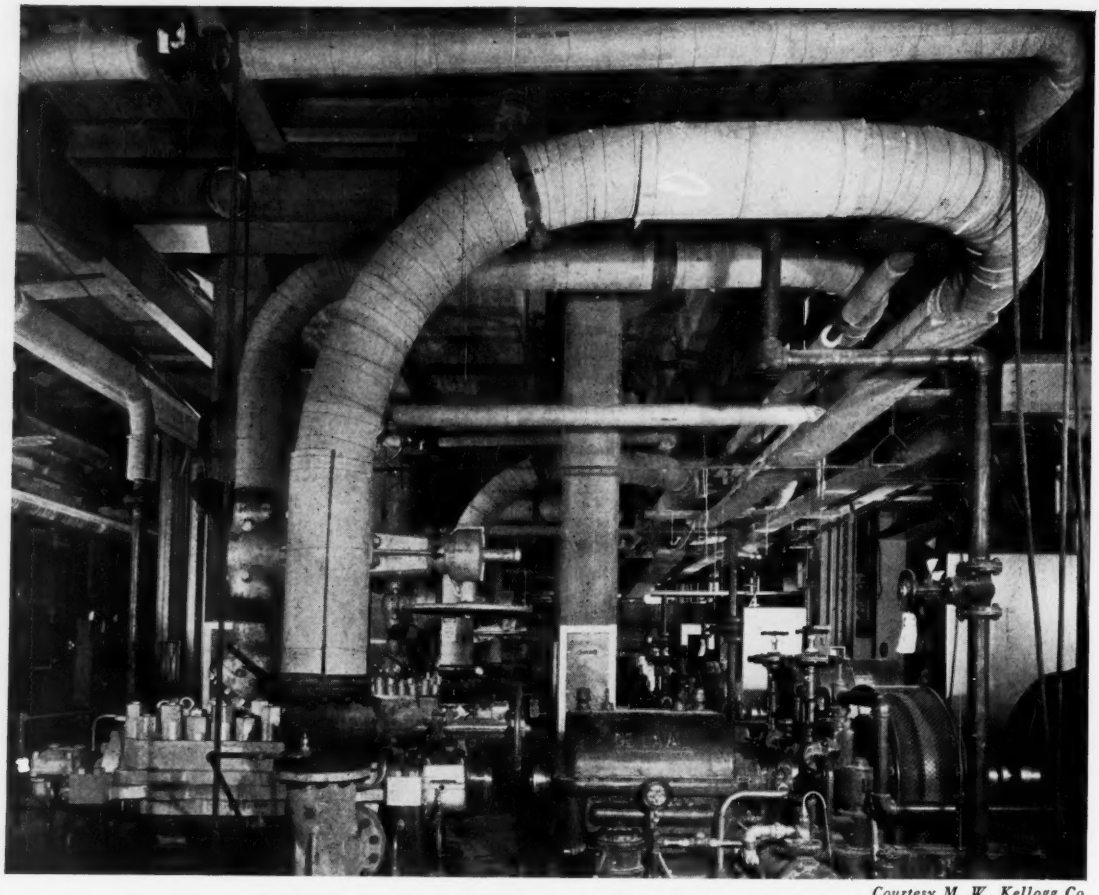
For each of the types of piping systems covered, the Code for Pressure Piping provides standard minimum safety requirements. These include requirements for the selection of suitable materials and reference to standard specifications by which they may be secured; the designation of proper dimensional standards for the elements comprising piping systems; the design of the component parts as well as the assembled unit, including necessary supports; the erection of the systems; and the test of the elements before erection and of the completed systems after erection.

The Code was first developed and issued as a tentative standard when it became apparent that the wide and diversified use of pipe throughout the country might prove to be a source of hopeless confusion if each community should decide upon different regulations. If, for example, a given article were accepted for 400-lb. steam service pressure in one state, 500-lb. in a second, and only 300-lb. in a third, systematic marking would be out of the question, a great deal of unnecessary duplication would be created, and the problem of stocking materials for quick shipment would be vastly complicated if not made impossible.

Many Groups Represented

The demand for a national safety code acceptable to manufacturers and fabricators of pipe and piping materials, to state safety and inspection agencies, insurance companies, and to industrial and designing engineers originated as far back as 1925 when the American Society of Mechanical Engineers requested the American Standards Association to initiate work on such a standard. Forty organizations were represented on the technical committee set up to develop the standard, with the ASME acting as sponsor for the committee. Among the principal groups represented were national engineering societies; trade associations; bureaus of the Federal government, including bureaus of the Navy Department and the Steamboat Inspection Service; safety engineers; inspection agencies; insurance underwriters; U. S. Department of Labor; building and ship-owners' associations; steel, cast-iron and brass manufacturers; power, oil, gas, and water-supply interests; consulting engineers; and independent experts.

[1] Mr. Crocker is Senior Engineer, Engineering Division, Detroit Edison Company.



Courtesy M. W. Kellogg Co.

Piping and boiler feed pumps in a power plant.

All sections of the Code have been extensively revised and enlarged in the new edition to bring it up-to-date. Some of the important revisions common to all sections are described below.

Barlow Formula

The principal pipe wall thickness formula, which appears in the several code sections for the various types of piping covered, constitutes one of the fundamentals of the code. The basic formula is the well-known Barlow formula[1] modified by the addition of a constant C which provides an allowance for threading, mechanical strength, and corrosion. This formula, by reason of its simplicity in application, and its proved accuracy in predicting the bursting strength of full length specimens of pipe subjected to hydrostatic bursting strength tests, was selected by the committee and reaffirmed for this edition of the code in preference to other formulas, which theoretically may be more correct.

Prior to its September 30, 1941, revision, the ASME Boiler Construction Code differed from the power section of the Code for Pressure Piping in that it had two bursting strength formulas, applicable to different size ranges, one of which differed significantly from the Barlow formula used in the piping code. In 1941, the ASME boiler code committee revised the paragraphs dealing with computation of pipe wall thickness to agree substantially with the requirements of the piping code. This is an important step toward harmonizing the requirements of the two codes, parts of which cover piping in the same general classification.

Lamé Formula

A major innovation in this new edition of the piping code, also recognized now in the boiler construction code, involves introduction of the

[1] The basic formula for pipe wall thickness is:

$$t_m = \frac{PD}{2S} + C$$

where t_m = minimum pipe wall thickness in inches;

P = maximum internal service pressure in pounds per square inch gage (plus water hammer allowance in case of cast iron pipe conveying liquids);

D = outside diameter of pipe, in inches;

S = allowable stress in material due to internal pressure, at the operating temperature, in pounds per square inch; and,

C = allowance for threading, mechanical strength, and/or corrosion, in inches.

Lamé formula as an alternate method for computing pipe wall thickness, particularly where the heavier walls are involved. The new formula has been added only to the power, oil, and district heating sections since the pressures involved in piping for the gas and air and refrigeration sections were not considered sufficiently high, in general, to warrant use of the more exact formula.

Several notes have been added to this edition of the Code, applying to the pipe wall thickness formulas and permitting a broader interpretation of the requirements.

How to Compute Allowable Pressure

In cases where actual measurements of wall thickness and outside diameter can be made on pipe already rolled, these actual measurements may be used to calculate the maximum internal service pressure for a given temperature. When computing the allowable pressure for a pipe of a definite minimum wall thickness, the value obtained by this formula may be rounded out to the next higher unit of 10. Then when specifying the special thicknesses in ordering pipe, which practice would be justified only on extremely large orders, it is customary to select a nominal thickness from some pipe schedule, such as the American Standard for Wrought-Iron and Wrought-Steel Pipe (B36.10-1939) so as to order the standard thickness next heavier than the minimum theoretically required.

Assign Zero Corrosion Factor for Non-Ferrous Pipe and Tubing

In the case of the corrosion factor for non-ferrous pipe and tubing, the sectional committee ruled that corrosion in the majority of cases is negligible in non-ferrous pipe and tubing carrying fluids permitted under the several code sections. In the case of plain end non-ferrous pipe and tubing, therefore, a *C* factor of zero is assigned. To provide adequate mechanical strength, particularly in the smaller sizes, minimum wall thicknesses were specified, which vary between the individual sections in accordance with what is considered safe practice for the fluids conveyed. These requirements correspond to those for non-ferrous pipe and tubing given in the ASME Boiler Construction Code, which have been found through long usage to be entirely satisfactory.

Allowable Stress

In the 1935 edition of the code, no specific sanction for using higher allowable stresses in computing pipe wall thicknesses for service temperatures below 650 to 700 F was given for the power, gas and air, or district heating sections, although the oil section permitted such adjustment. In view of the decreased hazard involved in conveying fluids below 650 F and down to 150 F, it was decided in the new edition to permit a lower factor of safety which is proportionate to the extent the temperature falls below 650 F. This permits correspondingly higher *S* values with the decreasing temperature. In the power section, for instance, a factor of safety of five is assigned at 650 F, and a factor of four at 150 F.

Other sections of the code have made similar provision for increased stresses at reduced temperatures except for the refrigeration section where the very low temperatures involved require special attention to offset the brittleness inherent there in many materials.

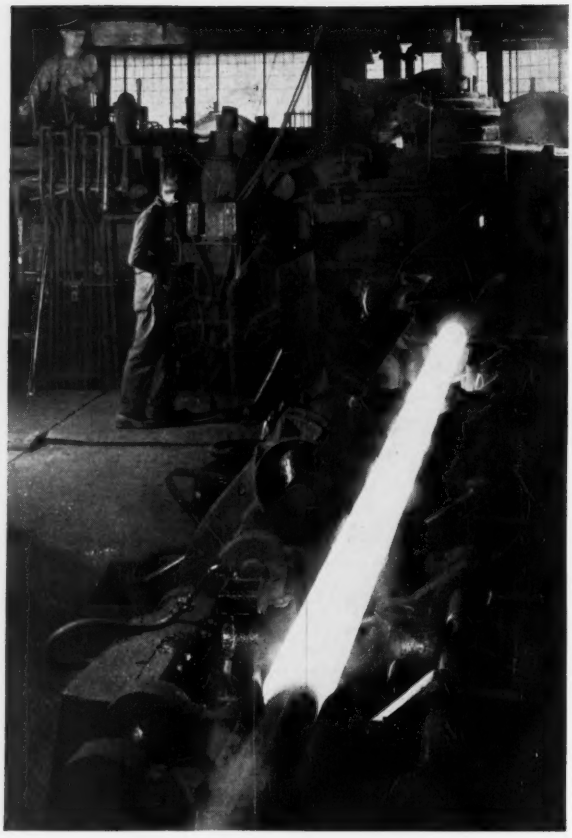
Differs from ASME Code

Contrary to practice in the piping code, the ASME Boiler Code does not permit higher stresses for ferrous pipe materials operating at temperatures below 650 F. In the case of fittings (and valves by inference) both codes permit increased allowable pressures as the temperatures decrease, in accordance with the standard ratings designated in the American Standard for steel pipe flanges and flanged fittings (ASA B16e). Where the temperature exceeds 650 F both codes require progressively decreasing working stresses, commensurate with the decreasing strength of the materials as the temperature rises. In the field of higher temperatures, the ASME Boiler Code committee and the piping code committee cooperated in setting *S* values for pipe so that the two codes would be in agreement on this vital point. The values for non-ferrous materials in the lower temperature bracket also will be made to agree in

A detailed discussion of the American Standard Code for Pressure Piping is available in a reprint of a series of articles by the chairmen of the different sections of the Code. This series of articles was published in *Heating, Piping and Air Conditioning* in successive issues from January through July, 1942.

Copies of the reprint can be obtained through the office of the American Standards Association.

The American Standard Code for Pressure Piping (B31-1942) was developed under the leadership of the American Society of Mechanical Engineers. Copies may be ordered from the American Standards Association at $2.00. ASA members are entitled to 20 per cent discount when buying approved American Standards through the ASA office.



Courtesy National Tube

One process in the manufacture of pressure piping

both codes. The new allowable stresses for many of the materials included have been changed from their previous values in order to keep abreast of the best existing knowledge of the properties of materials, particularly at the higher temperatures.

Welding Fittings

Welding as a means of fabricating and erecting pipe lines has developed rapidly since 1935 until, at the present time, few bolted joints are specified for pipe lines for high-pressure, high-temperature steam service. Valves for such service may now be obtained with welded instead of bolted bonnet joints, and this edition of the code specifically permits such construction. Where pipe must be disassembled frequently for inspection, as is the case with lines conveying high-temperature oil, bolted joints necessarily are used to a greater extent.

The rapid adoption of welded pipe joints has been accompanied by a corresponding development of factory-made welding fittings. These are made in a variety of forms such as elbows, tees, crosses, laterals, return bends, etc. An American Standard (ASA B16.9) on steel butt welding fittings has been developed and published, and another on steel socket welding fittings is under consideration. Materials specifications to cover these products have been formulated by the American Society for Testing Materials (ASTM A216, A217 and A234). The first two of these cover castings, whereas the latter covers wrought fittings.

Widespread use of these fittings is recognized in the piping code in providing that the dimensions, strength and marking of factory-made welding fittings shall comply with American Standard B16.9 for welding fittings.

Bolting

In the previous edition, carbon steel headed bolts were required to have dimensions in accordance with the "heavy series" of the American Standard for wrench head bolts and nuts (ASA B18.2). This requirement is occasioned primarily because of the long established trade practice of having all bolt holes in flanges $\frac{1}{8}$ in. larger than the bolts. As a result the regular series hexagonal nuts, and to some extent the square heads of headed bolts, tend to chew into the bolt holes rather than to ride securely on the face of the flange. A further reason for using the heavy series bolt heads and nuts is to afford a better wrench grip for pulling the bolts up as tightly as is necessary in pipe joints.

In using square headed bolts of heavy dimensions with cast iron flanges, however, some interference was found with fillets on the back of the flanges. Machining off the fillets was undesirable since the flanges were weakened and points of high stress concentration resulted. It was agreed, therefore, to permit the use of "regular series" square heads on carbon steel bolts since it would be impractical to demand a redesign of all fittings even though the "heavy series" bolt head dimensions are considered more suitable for bolts for piping work. Where heavy series heads are desired for this application the hexagonal rather than square shape should be used. Heavy series hexagonal nuts continue to be required in all cases.

Committee Interprets Requirements

The above revisions constitute some of the more important changes common to all code sections. In case questions arise in connection with the application of the Code in service, provision has been made that Subcommittee I on Plan, Scope, and Editing will interpret the requirements of the code should it be necessary. This committee is made up of the chairman and secretary of the main committee, together with the chairmen of each of the subcommittees.

Any one who has a question in regard to the provisions of the Code is invited to write to Sabin Crocker, Senior Engineer, Detroit Edison Company, Detroit, Michigan, chairman of the Subcommittee on Plan, Scope, and Editing of the Sectional Committee on Code for Pressure Piping.

Standard will be used as basis for Underwriters' listing when radio production again becomes possible

Here, the various circuits of the internal wiring of a small portable receiver are being checked.

Courtesy Underwriters' Laboratories

Fire Prevention Requirements For Electric Radios Revised

by H. B. Smith

Associate Electrical Engineer
Underwriters' Laboratories, Inc.

A FEW weeks ago, the November, 1942 edition of the Standard for Power-Operated Radio Receiving Appliances[1] of Underwriters' Laboratories, Inc., was given approval by the American Standards Association and is now a recognized American Standard. This is the sixth edition of the Standard, superseding the edition of April, 1938, and it is the third edition of the Standard which has had ASA approval.

The Standard contains the Laboratories' requirements for power-operated radio receiving appliances for non-commercial use, designed to be employed on interior wiring systems in accordance with the National Electrical Code. The requirements, in so far as they apply, cover also television receivers, non-commercial or domestic phonographs, record players, recorders, and similar equipment. Battery chargers, however, either portable or for permanent installation and not intended for use with radio appliances, are classed as rectifiers and are not covered by the requirements.

This current edition of the Radio Standard is the outgrowth of the Laboratories' experience with power-operated radio receiving appliances for about seventeen years, beginning with the examination and testing of separate A- and B-battery eliminators about 1926. Prior to that time, the radio sets in use by the general public had been crystal sets and battery-operated vacuum-tube sets which involved no hazardous connections to electricity lighting and appliance circuits. Eliminators were superseded within a year or two by power packs built into the receivers themselves, and from that time to the present practically all radio receivers have been complete and self-contained with only an external supply cord to be plugged into a convenient outlet.

[1] American Standard for Power-Operated Radio Receiving Appliances (C65.1-1942) 25 cents.

The general purpose of the Standard is to serve as a guide for the manufacturers whose products have been or will be submitted to Underwriters' Laboratories, Inc., for investigation, and for the Laboratories' engineers at the testing stations at New York, Chicago, and San Francisco where the examination and test work is done. Radio manufacturers knowing the requirements which their receivers must meet in order to be listed by the Laboratories are able to proceed with the details of design and construction, including what is frequently rather expensive equipment in the way of dies, tools, molds, etc.; and they are assured that listed receivers in competing lines will also have to meet the same requirements. With Standard requirements for reference, the Laboratories' engineers, although located at three widely separated points, are able to conduct their examination and test work with a high degree of uniformity—something which is particularly essential in work of this nature.

Reduce Fire and Accident Hazards

The Laboratories' work on radio appliances is to determine that the fire and accident hazards involved have been reduced to an acceptable degree. Accordingly, such features as the size, shape, and general appearance of a receiver or its selectivity, sensitivity, fidelity, and the various refinements of control and station selection are not investigated; and there is, therefore, practically nothing in the requirements covering these items.

The requirements call for a substantial enclosure which will house all live or current-carrying parts involving fire or accident hazard, except cords or cables. Capacitors and inductors operating at a potential obtained directly from a metallic conductive connection to the power-supply circuit and involving fire hazards are required to be housed within a complete enclosure of noncombustible material. The area of openings for ventilation or other purposes is limited. The type of flexible cord for connection to the supply circuit is specified and provision is made for suitable bushings and strain relief in connection with the cord.

Materials and Devices Must Comply with Requirements

The various materials used are required to be products which are recognized as suitable for the particular application; and accessories such as receptacles, lamp-holders, switches, etc., are required to be devices which comply with the Laboratories' requirements for those classes. Capacitors are required to present no undue fire or accident hazard. Substantial transformers with impregnated coils are specified, and definite limitations are placed upon the ventilating openings in transformer enclosures. Appropriate insulated conductors are required for all interior wiring, and spacings throughout a receiver are specified. Special attention is given to the accessibility and hazards of live parts. Fire and accident hazards are defined and provisions are made for the reduction of these hazards to an acceptable degree.

The complete investigation of a radio receiver consists of a careful examination of construction details to determine that the appliance complies with the above-mentioned requirements, and a comprehensive test program designed to insure the safe operation of the receiver under the conditions of actual service—including some of the abnormal conditions which are likely to obtain.

To Be Checked by Tests

The features which are checked by means of tests include:

Power Consumption—A determination of wattage input, to insure that the power required to operate a receiver is not more than 5 per cent in excess of the marked rating on the appliance.

Leakage Currents—A determination of the currents which may flow from exposed or partially protected live parts. Such leakage currents are required to be held within safe limits.

Temperature—Operation of a receiver under normal conditions to determine that specified temperature limits on various materials and parts are not exceeded. Temperatures high enough to present any fire hazard and temperatures which would result in the deterioration of insulation or other essential nonmetallic material are not considered to be acceptable.

Dielectric Strength—A comprehensive check on the adequacy of the insulation and spacings throughout a receiver, with particular reference to the factor of safety over the potentials normally existing at various points.

Strain Relief—A 35-pound test on supply cords.

Abnormal Operation—Special tests on parts which are normally operated for limited periods of time, but which may be operated continuously under abnormal conditions. Pull-out tests on separable connectors. Short circuit tests on capacitors and cables.

New Features in Revised Edition

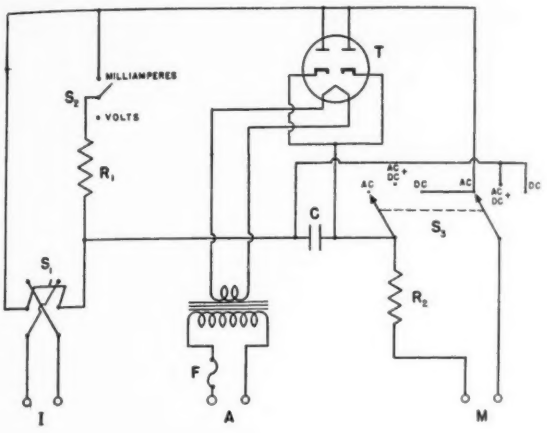
Among the new features of the revised edition of the Standard are the following paragraphs relating to shock hazard, and a description and wiring diagram of a device with provision for input, line, and meter connections which has been found to be suitable for determining compliance of a radio receiver with the new requirements for voltages and corresponding leakage currents at exposed or partially protected live parts.

A current-carrying part which involves shock or fire hazard shall be spaced or otherwise suitably insulated for the voltage involved and suitably protected for the expected service.

Shock hazard shall be considered to exist at a live part in a circuit involving a potential of 125 volts or less in the following cases:

(A) At an exposed live part, if the open-circuit potential is more than 25 volts and the current with a 1500-ohm load is more than 5 milliamperes.

(B) At a partially protected live part, except as noted in paragraph 75, if the open-circuit potential is more than 35 volts and if the current with a 1500-ohm load is more than 15 milliamperes, with a maximum allowable A-C component of 10 milliamperes in any case.



A — Terminals for the connection of a 120-volt A-C supply circuit.
C — 0.5 mf paper capacitor.
F — Fuse in the transformer primary circuit.
I — Terminals for input connection from the appliance under test.
M — Terminals for the connection of a meter having a full-scale deflection of 100 microamperes.
R_1 — 1500-ohm resistor.
R_2 — 2,121,000-ohm resistor.
S_1 — Reversing switch (two-pole, double throw).
S_2 — Single-pole switch (may be double-throw) with settings for reading volts or milliamperes on the meter.
S_3 — Two-pole, three-point selector switch with settings for reading AC, DC, or AC + DC on the meter.
T — Twin-diode tube, No. 6H6.

For AC plus DC—Throw the reversing switch, S_1 to the position which gives the maximum reading.

(a) For current, the reading is in milliamperes (rms of the sine wave or 0.707 times the peak of the complex wave),

(b) For potential* in volts, multiply the reading by 1.5 (rms of the sine wave or 0.707 times the peak of the complex wave).

For AC Only—The meter readings are the same as (a) and (b). If different readings are obtained using both positions of the reversing switch, the average of the two readings is to be taken.

For DC Only

(c) For current in milliamperes, multiply by the reading 1.414.

(d) For potential in volts, multiply the reading by 2.12.

* If the potential measured is limited by a series impedance within the appliance, the reading of the meter is less than the open-circuit voltage; but under this condition, the impedance also limits the current leakage. As the series impedance approaches a capacitive reactance—i.e., as the parallel resistance component of the impedance becomes large—the AC + DC reading becomes less than the AC reading; but under this condition, the AC reading is a suitable measure of the open-circuit voltage.

At the present time, in accordance with the orders of the War Production Board, there is no production of radio receiving appliances for civilian domestic use. The Standard does not cover commercial or military radio equipment, and there is, therefore, practically nothing being made at this particular time which is judged under the requirements. The Standard has, however, been carefully studied by all the manufacturers of listed power-operated radio receiving appliances and reviewed by others known to have an interest in the subject; and in its up-to-date form will be available for use by the Laboratories, the manufacturers, and others concerned as soon as the present war emergency is over.

ASA Approves Standards For Petroleum Products

The American Standards Association recently approved two new and four revised standards on petroleum products and lubricants. These standards were submitted by the American Society for Testing Materials as sponsor for the ASA Sectional Committee on Petroleum Products and Lubricants (Z11), which cooperates closely with ASTM Committee D-2.

The two new standards approved by the ASA are:

Test for Carbon Residue of Petroleum Products (Ramsbottom Carbon Residue) (ASTM D524-42) American Standard Z11.47-1942 25¢

Test for Tetraethyl Lead in Gasoline (ASTM D526-42) American Standard Z11.48-1942 25¢

The revised standards also approved are:

Test for Flash Point by Means of the Pensky-Martens Closed Tester (ASTM D93-42) American Standard Z11.7-1942 25¢

Test for Gum Content of Gasoline (ASTM D381-42) American Standard Z11.36-1942 25¢

Test for Melting Point of Paraffin Wax (ASTM D87-42) American Standard Z11.4-1942 25¢

Test for Vapor Pressure of Petroleum Products (Reid Method) (ASTM D323-42) American Standard Z11.44-1942 25¢

Copies may be obtained from the American Standards Association, 29 West 39th Street, New York, N. Y., at 25 cents per copy.

In connection with these standards attention is called to the most recent edition (October, 1942) of the ASTM Standards on Petroleum Products and Lubricants containing all ASTM specifications, tests, and definitions on the subject. Some 87 standards are included. In addition there are several proposed tests not yet adopted by the committee covering oil content of paraffin wax, color of lubricating oil by means of photoelectric colorimeter, potential gum in aviation gasoline, and oxidation characteristics of heavy-duty crank-case oils. Copies of this widely used 450-page publication can be obtained in heavy paper cover from ASTM Headquarters, 260 South Broad Street, Philadelphia, Pa., at $2.25 per copy.

A. W. Whitney Retires

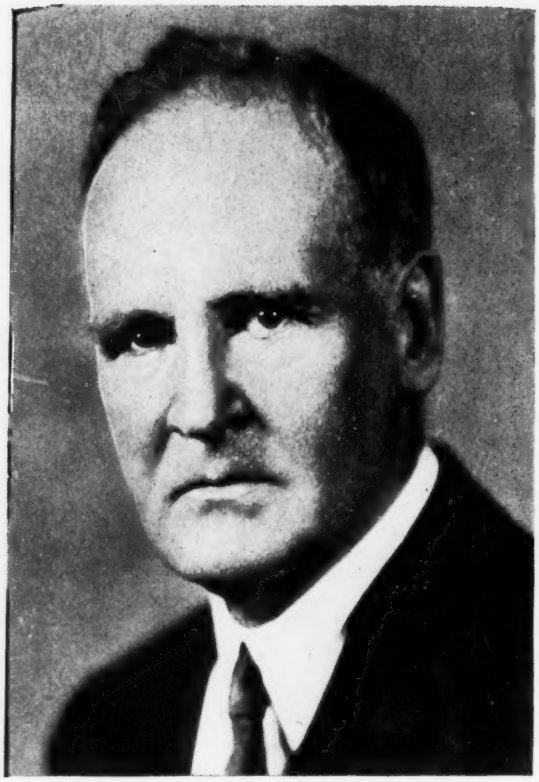
ALBERT W. WHITNEY, who has been for many years one of the most important figures in the safety and standardization movements in the United States, retired from active duty January 1, 1943. Mr. Whitney, a vice-president of the National Safety Council for 18 years, had been active in the work of the American Standards Association since 1922. One of Mr. Whitney's most noted achievements was the introduction of safety education for children in the schools. In this connection he has been closely associated with the U. S. Office of Education, and the Children's Bureau of the U. S. Department of Labor. The Center of Safety Education, established at New York University four years ago, was his idea.

When Mr. Whitney was first associated with the work of the American Standards Association, the Association was a coordinating committee for standards known as the American Engineering Standards Committee. His influence played a large part in enlarging the scope of the AESC to include work on safety and to bring government and trade associations into active membership. This enlargement of the scope of the Committee was the first step which led to a change in the organization from a Committee representing only technical societies to an Association in which all groups are represented, and made possible the present extensive national program of the ASA. Mr. Whitney took an active part in the reorganization work.

Mr. Whitney has been a member of the ASA Standards Council continuously from 1922 to the present time. In addition to serving as its chairman from 1922-1924, he was vice-chairman last year.

Important Contribution at Pan American Conference

One of Mr. Whitney's important contributions to standardization was as a member of the First Pan American Standardization Conference, which was held at Lima, Peru, in 1924. For that meeting Mr. Whitney prepared a statement about standardization in modern life which remains one of the most comprehensive and penetrating statements yet prepared. It was published by the Central Executive Council of the Inter-American High Commission, with an introduction by Herbert Hoover, then president of the Council. The importance of standardization in our present war efforts and for the post-war period, and the growth of inter-American cooperation on



standards, makes republication of the statement at this time particularly timely (page 21).

The American Standards Association has recognized Mr. Whitney's important contributions to the ASA in the following resolution:

Resolved, That the following be spread on the minutes in recognition of the outstanding part Albert W. Whitney has played in the development and work of the American Standards Association:

For 23 years Mr. Whitney has been a member of the Standards Council. He took an active part in the enlargement of the membership of the original body, the American Engineering Standards Committee, and served as its presiding officer for the critical three-year period from 1922-24. In the difficult days of the reorganization of the AESC into the American Standards Association in 1928-29, Mr. Whitney proved a veritable tower of strength, contributing not merely his fine grasp of the fundamentals of the standardization process, but his keen sense of humor to relieve many a tense situation.

In addition to his contributions to the work of the Association as a whole, as representative of the National Bureau of Casualty and Surety Underwriters, and more recently of the National Conservation Bureau, he has rendered exceptional service in the safety code field, and to the accident prevention movement in general.

Mr. Whitney headed the U. S. Government delegation to the first Pan American Standardization Conference, held in Lima, Peru, late in 1924, in preparation for which he wrote "The Place of Standardization in Modern Life" (published in this connection by the Central Executive Council of the Inter-American High Commission in Washington), which is probably one of the most basic documents on the philosophy of standardization.

To Mr. Whitney the American Standards Association owes a very special debt of gratitude, which we wish to record on the occasion of the severance of his official assignment in ASA work.

The Place of Standardization in Modern Life

by Albert W. Whitney

IT IS not uncommon nowadays to see articles and editorials and letters in the public press deploring the state of uniform mediocrity that standardization will produce if allowed to have its way; this may even be considered to be a standard objection to standardization; in fact, with fine irony, a syndicated editorial on the evils of standardization has recently appeared in papers throughout the country.

That the question is receiving public attention indicates two things: First, that standardization is now generally recognized to be a matter of importance, and, second, that either a real danger exists or else a popular misapprehension of what standardization aims to accomplish. In any case the situation calls for light and discussion.

Business and industry must increasingly feel an obligation to discover the social implications in what they are doing. It is not enough to justify an institution merely by its effect upon business, for business, the supplying of the material needs of the world, must look for its own justification to its effects upon society. The place of standardization must therefore be judged from this broader, more thoroughly human point of view.

Is Standardization Necessary?

The questions that must be considered are these: Is standardization a desirable and necessary process; if so, what is its exact place in the world; and, second, how is it susceptible of abuse and how can such abuse be avoided? In order to answer the first and main question it will be enlightening to realize the part that standardization has played in nature.

The processes of nature and of men are, after all, very much alike. The designing room of nature is continually turning out new ideas in plant and animal life. These she tries out not on a special testing floor but in life itself. If they are worth while, the new forms find a place for themselves and live; if they are badly designed, they die and leave no descendants and the model is discontinued.

The advance that man has made, building upon all that nature can give, lies in the ability to experiment. He does not have to wait for the slow process of mutation and for an actual trial in life itself. Thought consists essentially in the ability to try the world out in imagination. The architect's plan for a house is essentially his way of being able to live in imagination in the house, and if in this imaginary life he finds that there are no stairs to the attic and that he has an inconvenient time getting a bath, it is not necessary to tear the house to pieces in order to make the correction but only to do some more thinking. All thought, even the most abstract, is essentially a way of imagining life.

There should be then a strong resemblance between the processes of nature and the processes of man, the difference being that nature works through the infinitely slow method of trial and error and deals with life itself, while man works largely in a thought world and in the laboratory which, while one stage nearer, is still far short of being actual life. All this being so, the part that standardization has played in nature should give us a very excellent idea of the part that standardization can play and should play in the world of human activity.

Nature, by some innate property of germ plasm, stimulated apparently by the varying conditions of the environment, is perpetually creating new variations in plant and animal life. This is precisely analogous to the creative faculty in human thought. This process of nature, uncontrolled, would fill the world with endless variety. There would not only be the myriad types that we now have but innumerable modifications of those types. Natural selection, however, acting upon this variety, has had the effect not only of choosing certain types as worthy to survive but of endowing these types with a certain degree of permanence and stability and isolation. It is as though nature had not only given each type a chance to survive but had gone further and cleared out the weeds near by so as to give it the best possible opportunity to get light and air.

Nature Develops Stable Types

The effect is that nature, instead of filling the world with a continuum of plants and animals, has filled it with a discrete and actually enumerable assemblage of types, and furthermore, an ordered assemblage, each of which has a considerable degree of stability and among which

certain type-conserving forces operate such as those that inhibit miscegenation.

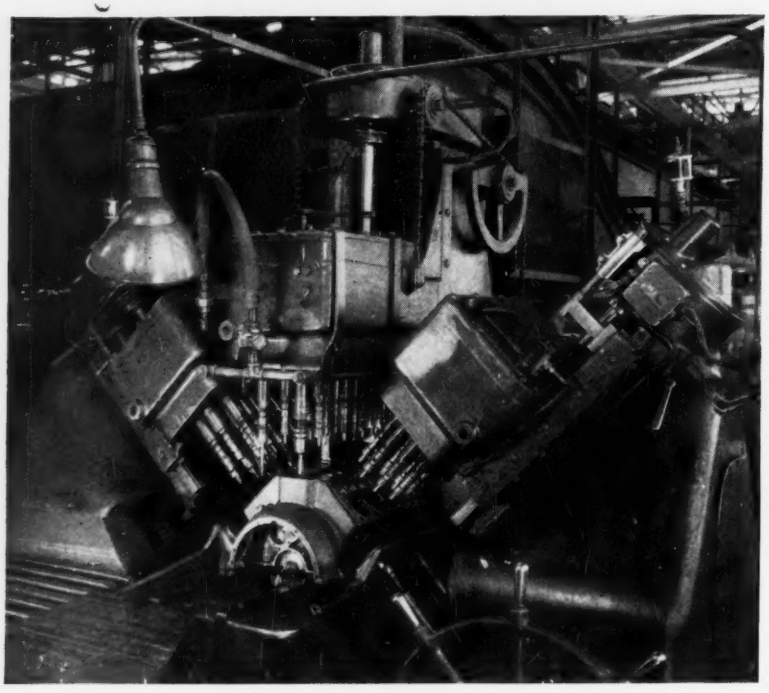
Now, this establishment of a system of discrete and enumerable types in nature is the exact analogue of standardization as a purposeful, human activity, and the two are subject to the same laws and to the same abuses.

Not only has nature developed types which can be enumerated and classified, but she has standardized for each a multitude of organs and functions. Individuals of the same species resemble each other in the minutest details of structure and function. If this were not so, organized life would be practically impossible. Everything would be an individual problem with no possibility of generalization. Institutions and customs would be impossible, for institutions and customs and laws depend upon an underlying sameness of reaction. There could be no medicine, for there would be no uniformity of physical organization or response; there could be no surgery, for the surgeon would not know whether he were cutting into a heart or a liver; there could be no organized education, because each mind would be an educational problem by itself. An underlying sameness is the basis for every civilization.

I do not overlook the fact that with this sameness goes along a strong flavor of variety and individuality. No two faces are exactly alike and no two temperaments and personalities are exactly alike, but this very difference, which undoubtedly gives not only much of the charm to life but which is as well the cutting edge of progress, can flourish only on a deep-lying basis of uniformity. It is the differences that persist, some of them racial but many of them cutting across racial lines, that account for the actual diversity of civilizations and institutions. Thanks be for the diversity, but, still more deeply, thanks be for the sameness that makes the diversity possible and effective!

There are, then, in nature these two fundamentally different tendencies: First, a force that is continually operating to produce greater variety and, second, a force that is continually operating to eliminate unsuccessful variations and to concentrate upon relatively few types which in their main features are reproduced faithfully from generation to generation.

Now, both of these processes are absolutely necessary in a world of progress and each depends intimately upon the other. Variation is creative, it pioneers the advance; standardization is conservational, it seizes the advance and establishes it as an actual concrete fact. Variation is primarily concerned with quality; standardization is primarily concerned with quantity, that is, with mass production. If the world were broken up into an innumerable number of forms, with no rallying points at which nature had carried on mass production, there would be no way of expressing the fact that the successful type had been discovered. In order to make progress not only must there be a better type, but it must be made the prevailing type. If nature had no mechanism for fixing and holding the type, she would have no way of capitalizing her discoveries. Furthermore, there would be no adequate basis from which to spring in order to make the next advance. Variation is the active, creative, masculine force in evolution; standardization is the passive, brooding, conservational, feminine force



"Standardization is primarily concerned with quantity, that is, with mass production."

out of which comes the potency of the next advance.

When we come to the directed, purposeful evolution of human society the main lines are the same. Creation is here essentially variation from normal. Poincaré has even ventured the thought that creation, carried on as it is largely in the subconscious, may be fundamentally fortuitous, the most actively creative mind being that one which is able most quickly and most surely to run through all possible combinations of the elements of the problem and to appropriate those that have value. It is as though the mind were a shaker of dice, the most creative mind being the one that shakes the dice most eagerly and is most clever in seizing the winning combination. Standardization is here as in nature the selective and conservational force, the selection being made consciously, however, instead of through trial and error, although even in human standardization actual experiment has a large part to play.

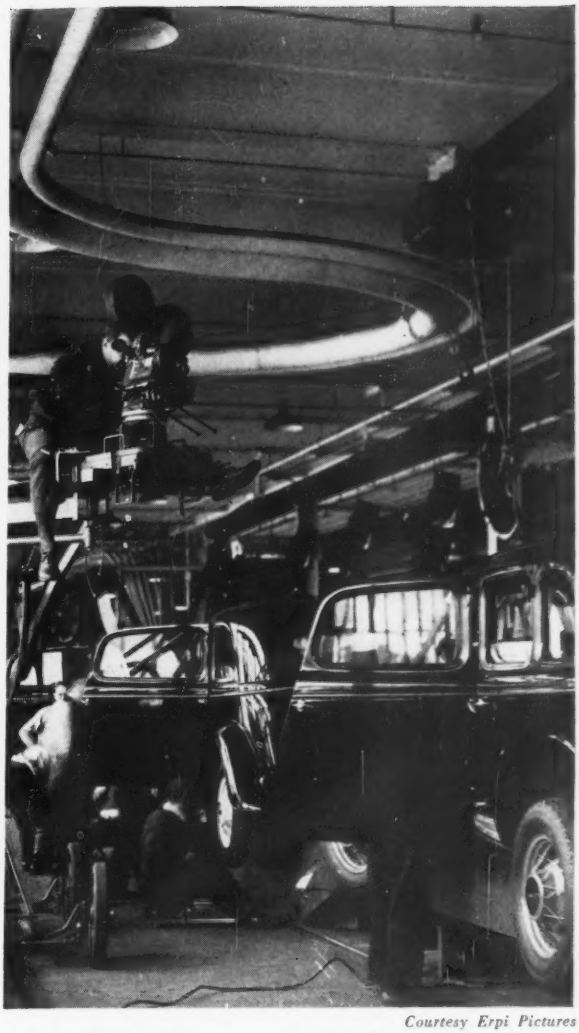
Economic Laws Fortify Type Selection

When the type has been thus selected, economic laws fortify the selection by directing the forces of mass production upon it and it assumes a place much analogous to that of a species in the world of nature. So, just as in nature, standardization operates to capitalize the advance by making it an actually prevailing type.

It is this effect that is commonly in mind when the attempt is made to evaluate the place of standardization in civilization. It is measured in terms of its effect upon mass production, it is evaluated as an instrument for making the advantages of life more abundantly available; and the critics of standardization also attack it at exactly this point, claiming that its effect is coarsening since its results are to be measured in terms of quantity rather than quality. They conceive of standardization as producing a world of universal, dull mediocrity in place of the world of color and scintillating lights and shadows and heights and depths that we have under the play of individual initiative.

While such adverse effects if produced will be largely due to the unwise use of standardization it is also quite necessary and pertinent to say that such criticisms completely overlook another and equally important effect of standardization that is quite wholly on the other side of the balance. I refer to the effect of standardization as liberator rather than conservator.

Suppose the world of living nature really had the properties of a continuum; it would be a world of complete individualism; there would be no foci about which to group mass action, about which to gather the integrating and ameliorating forces of affection and loyalty. It would be a mad, restless, wearying world of infinite



Courtesy Erpi Pictures

"Standardization . . . is an indispensable ally of the creative genius."

but meaningless variety and detail, obeying no laws except the laws of probability, to which even the molecules in their aimless wandering give allegiance.

Creative work in such a world as this would be an impossibility. Nothing would stay put; there would be nothing to stand on to make a fresh advance. All one's energies would be used up in meeting the idiosyncrasies of the immediate moment. In the field of industry each piece of machinery would be an individual problem, even each screw, each bolt, and each nut. What time would be left over amid such maddening detail for fresh advances?

Standardization is thus the liberator that relegates the problems that have been already solved to their proper place, namely to the field of routine, and leaves the creative faculties free for the problems that are still unsolved. Standardization from this point of view is thus an indispensable ally of the creative genius.

Nature has very well understood the necessities of the situation. She has not only provided the brain with which to solve new problems but she has provided the reflex nervous centers to which the brain may relegate the control of habits, which are only the clerical assistants of thoughts, so that the brain may be set free for a more primitive contact with reality. Standardization is similarly the habit-forming process in industry.

Standardization Has Wide Scope

I have referred specifically to standardization as having to do with types of plants and animals and also to the industrial standardization that we are familiar with, but in passing I should call attention to the fact that standardization has a still wider scope. In a very real sense all the conservational forces of civilization are within the field of standardization, institutions, customs, laws, literature, and other forms of art, science —they all involve the fixation of advances which have been made into a better understanding of the world, and such advances are in turn points from which to make fresh advances.

So far I have been concerned solely with what might be called the hygiene of standardization; that is, with evaluating the place that it should play in the world under normal conditions. This is a far easier task than to treat the pathology of standardization, that is, how it may be abused in a world that is itself more or less out of joint.

Standardization undoubtedly has its diseases; it would be strange if it did not. It is curious that nature itself has misused it. Nature having discovered the type, proceeds to produce replicas in incredible numbers; the way in which babies, guinea pigs, grasshoppers, and dandelions appear in the world beats any feat of industrial mass production. And often such production of nature is quite unsuited to actual conditions or is productive of positive harm, as when a small apple tree produces so many apples that not only are they of inferior quality but they are produced at a sacrifice to the vitality of the tree.

Is Fundamental and Necessary

Standardization itself is so thoroughly fundamental and necessary a process in both nature and civilization that any evil effects must evidently be looked for not in the process itself, but in the way that it has been applied. It is probable that all abuse of standardization comes from directing it toward too limited an objective. It is either used to accomplish some immediate purpose, overlooking the larger and fuller good that might be accomplished if a longer view into the future were taken, or it is used to meet the needs not of the public as a whole, but of some particular interest. Nature, when she let the apple tree overload itself, allowed herself to be unduly concerned with the danger of the world's running out of apple trees in the next generation, overlooking not only the need of keeping the trees she already had but the need of good apples for the present generation. She erred in this particular case by being too far-sighted. We commonly err on the other side by aiming at an increase in our immediate material production, when this can be had only by the sacrifice of greater ultimate values.

The further we progress on the road of industrial standardization, from standardization by the individual worker to standardization by the factory, from standardization by the factory to standardization by the industry, from standardization by the industry to standardization for all industries on a national basis, the more clear does it become that standardization must be a process by which a consensus of all interests is reached in a thoroughly representative and democratic manner. Nothing else has permanent value; but when standards are prepared in this way we are made to know that we are on the right road by what has always been the sign to those that have kept the faith, a miracle.

When diverse elements are brought together, the result may be a compromise; it often is a compromise, particularly if the result is reached through the efforts of those who do not understand and who make no effort to understand, but when a body of sincere, well-meaning, understanding persons come together in the continuing presence of the truth, however diverse their interests may apparently be, a marvelous thing happens,—a solution appears which is not a compromise but which in the majority of cases is the best for all concerned.

Little to Fear from Well-Developed Standards

There can be little to fear from standards that have this quality. I can scarcely believe that the movements of the trained athlete, the swimmer, the oarsman, the tennis player, which are primarily chosen to produce the most effective results with the least effort, are not performed with a grace and ease that bring enhanced satisfaction to both the athlete and the spectator. I can scarcely believe that motion that will produce the greatest physical results with the least fatigue will not be correlated with both bodily and emotional satisfaction to the worker.

The sine curve and the catenary which are the very symbols of physical rightness in a multitude of fields are also lines of the most subtle beauty. The hawk when he descends in the form of a cycloid most quickly to reach his quarry is also executing a movement of perfect grace.

It is not the real standards that we need be afraid of. If they are right, they will find a place for themselves in civilization and will only go towards building up that great, wholesome, restful, sameness which is the real basis not only for a democracy, but for an aristocracy, and the

only basis on which new growth can take place. It is the standards that do not represent a real consensus of all those interests that are concerned in progress which we should fear.

The safeguards against bringing such ill-begotten standardization into the world can only be a realization of the high and serious mission of the standardizer, and an almost religious consecration to the duty and privilege of helping to direct progress in this fundamental way.

There are a world of practical questions that might be discussed that have a bearing on how we can more effectively perform our work so as to avoid these errors which our critics fear and others which they are not clever enough to realize: How early in the development of an art should standardization begin? What fields should be avoided? How far should standardization and simplification go? What can be done to make standardization not a process of permanent but of only relative fixation, not impeding progress but changing with progress, and, most important of all, how can we most effectively bring to bear upon the problems of standardization such a broad vision that we shall make it a real instrument of progress itself?

These are the practical problems, but they are beyond the scope of this present paper.

In closing may I make an application of this reasoning which will have the advantage not only of concreteness but of having a practical bearing upon our modern life?

The development of the common law is a remarkable example of the working of standardization. In fact, it is perhaps that institution of civilization which comes most near to being a natural process. The common law is the result of the gradual growth of a consensus of opinion as to what conduct will on the whole produce the best possible society. It is a slowly acquired body of standardized conduct. It is not the work of a legislature that not only does not understand, but often does not care, except for the partisan appeal of some special interest.

Something with the fundamental quality of the common law must be as the basis of every great development in civilization, and some such process must be used to make the necessary adjustments in our industrial development, but with our rapid life of today we can not wait for such slow unfoldings of public opinion. We must secure the same results by an accelerated process. Standardization by a body of experts representing all interests and working in constant contact with the facts is our modern substitute for the process of the common law, and if this process is conscientiously and intelligently carried out it should have much the same qualities as the common law.

It is obvious that with our increasingly complicated and interdependent industrial civilization, there must be a mass of technical questions of a public and semipublic character that must be adjudicated, matters involving the interrelations and accommodations of various industries with each other and with the public, such matters for instance as the crossing of tracks by high-tension transmission lines, the inductive interference among various users of wires and the air, questions involving the properties of materials and their proper use.

If the courts are to be used for the adjudication of such questions as these, it can only be at large expense and with great inefficiency and resultant dissatisfaction. The courts are essentially an inexpert institution. They are not naturally fitted to handle technical problems. Industry for its own best good must see that such adjudications are built up on an expert technical basis. Most of such questions will then not get into the courts, or if they do the courts will be inclined to confine themselves to the more strictly legal phases of the cases, basing their decisions upon an underlying technical consensus. One of the most important functions that standardization can perform today is to build up on a national interindustrial basis a consensus of expert opinion with regard to the interrelations of industry and the relations of industry to the public.

War Standard Clothing Sizes May Help Control by OPA

As a possible basis for Government control of production and distribution of children's clothes, the Office of Price Administration has asked the American Standards Association to develop War Standards for body sizes of boys, girls, and infants.

The work on boys' sizes will extend the present American Standard body sizes already set up for boys from kindergarten to high school age to include sizes for younger and older boys.

Since the project had already been started, the ASA was asked by the OPA to speed it to completion as rapidly as possible under the War Standards procedure.

"The OPA is now faced with the problem of developing standards for sizes of various clothing items which will be needed for use in rationing and in preparation of new price regulations. It is essential that these clothing sizes be based on the best information obtainable and we feel that the body size standards you contemplate would provide such a basis," the OPA declared.

ASA Electrical Committees Report on Year's Activities

WAR needs have had a noticeable effect on the activities of the ASA sectional committees on electrical projects, it is shown in the reports of these committees given below. Many committees have postponed their regular work or have concentrated their efforts on emergency revisions to meet wartime needs. Despite this wartime activity, 19 regular standards were approved by the ASA during the past year on recommendation of the Electrical Standards Committee, ASA coordinating committee for electrical standards.

Canada and United States Cooperate

Cooperation between Canada and the United States on electrical problems was furthered during the past year by an invitation from the Canadian Engineering Standards Association that the ASA appoint a corresponding member on standards committees working on the Canadian Electrical Code. The Electrical Standards Committee has recommended that Victor H. Tousley, secretary of the ASA Committee on the National Electrical Code and Electrical Field Secretary of the National Fire Protection Association, be appointed corresponding member of the committee on the Canadian Electrical Code, Part I, and that A. B. Smith, of the National Electrical Manufacturers Association, be named as corresponding member for Part II of the Canadian Electrical Code. In taking this action the ESC expressed "the great appreciation of the ASA and the electrical industry in the United States for this concrete expression of the close harmony between industry in the two countries." The ESC recommended that the ASA invite the Canadian Engineering Standards Association to appoint corresponding members on the committees in charge of the National Electrical Code (ASA C1). It called attention, however, to the fact that the ASA has no committee similar to the one in charge of Part II of the Canadian Electrical Code, which covers standards for electrical wiring and devices. This work under the ASA is handled by the proprietary sponsorship method through Project C33, which at present is inactive.

The reports of the electrical committees given below indicate the status of the work under the jurisdiction of the Electrical Standards Committee. The organizations sponsoring the work are listed following the report of each committee. When the names of the chairman and secretary of a committee are given, the Electrical Standards Committee itself is acting as sponsor.

The Electrical Standards Committee, coordinating committee for all ASA electrical projects, has the following officers:

Charles Rufus Harte, The Connecticut Company, *Chairman*

Sidney Withington, New York, New Haven and Hartford Railroad, *Vice-Chairman*

J. W. McNair, American Standards Association, *Secretary*

National Electrical Code (C1–1940)—

An Emergency Committee has been appointed to act for this sectional committee on problems arising from war conditions. This Emergency Committee has had four meetings, and has approved a number of tentative interim amendments. These have been published and recommended to the authorities enforcing the National Electrical Code for the duration. The sponsor has approved a suggestion by the sectional committee that consideration of a new edition of the Code be deferred until after the war.—*National Fire Protection Association.*

National Electrical Safety Code (C2)—

A revision of the first five parts of this Code was completed and approved late in 1941.—*National Bureau of Standards.*

Code for Protection Against Lightning (C5)—

Revision of Part III, for the protection of structures containing liquids and gases, is now going forward. V. E. Goodwin is chairman of a subcommittee which has proposed certain changes and a draft of the revised Part III is now being considered by the sectional committee. The committee hopes to complete this revision early in 1943.—*American Institute of Electrical Engineers; National Bureau of Standards.*

Terminal Markings for Electrical Apparatus (C6)—

The canvass of product groups carried out last year to obtain recommendations for improving this standard is now complete, and the recommendations are being correlated for submittal to the sectional committee—*National Electrical Manufacturers Association.*

Insulated Wires and Cables (C8)—

W. H. Bassett, Jr., who has been secretary of this committee for some time, is now in military service and C. S. Gordon has been appointed secretary. W. F. Davidson has been reappointed chairman. Standard specifications for Slow-Burning Wire and Cable (C8.9-1942), for Cotton Braid for Insulated Wire and Cable (C8.12-1942), for Varnished Cloth Insulation for Lead-Covered or Braid-Covered Power Cable (C8.13-1942), and for Metallic Coverings for Insulated Wire and Cable (C8.15-1942) were

approved in February. Due to urgent work on war standards in the ASA office, publication of these standards has just now been completed. The standard on URC Type Weather-Resistant (Weatherproof) Wire and Cable (C8.18) was approved by the ASA in December. A revision of the Bare Copper Cable for Insulated Conductors (C8.14-1938) is under way, but unfavorable opinion has been expressed on including all types of stranding in one standard.

The ASA staff has brought to the attention of the Executive Committee the importance of War Emergency standards and the ASA War Standards procedure for developing them. The members of the committee have also been asked to keep in mind the importance of substitute materials and modifications of specifications to assist in the war effort.—*W. F. Davidson, Chairman; C. S. Gordon, Secretary.*

Hard-Drawn Aluminum Conductors (C11)—

This committee has not been active this year and no revision of this standard is being considered.—*American Institute of Electrical Engineers.*

Code for Electricity Meters (C12)—

A revised paragraph to permit longer periods between tests for certain types of watthour meters was approved as a War Standard revision.—(INDUSTRIAL STANDARDIZATION, Dec., 1942, p. 314).—*National Bureau of Standards; Electric Light and Power Group.*

Tubular Steel Poles for Electric Line Construction (C13)—

There has been no action by this committee during the past year.—*American Transit Association.*

750-Volt Direct-Suspension Overhead Trolley Contact Construction (C 15)—

There has been no activity in connection with this project during the past year.—*American Transit Association.*

Radio (C16)—

The American Recommended Practices on Loud Speaker Testing (C16.4) and on Volume Measurements of Electrical Speech and Program Waves (C16.5) were completed and approved this year. (See article page 306, INDUSTRIAL STANDARDIZATION, Dec., 1942.)—*Institute of Radio Engineers.*

Dry Cells and Batteries (C18)—

There has been no activity on the part of this committee this year.—*National Bureau of Standards.*

Industrial Control Apparatus (C19)—

A third draft of a proposed revision of the standard approved by the American Standards Association in 1928 is now being voted upon by this committee.—*American Institute of Electrical Engineers; National Electrical Manufacturers Association.*

Insulators for Electric Power Lines (C29)—

A letter ballot is now being taken in this committee in regard to a revision of American Standard Insulator Tests (C29a-1930).—*J. A. Brundige, Chairman; A. B. Campbell, Secretary.*

Electrical Devices and Materials with Relation to Fire and Casualty Hazards (C33)—

There has been no change in the status of this project during the year.—*Underwriters' Laboratories.*

Mercury Arc Rectifiers (C34)—

A recent survey made by the Standards Committee of the American Institute of Electrical Engineers shows that revision of the report on this subject issued in June, 1934, is now desirable. Dr. C. H. Willis of Princeton is the new chairman of the committee succeeding Dr. Moreland. The committee is being completely reorganized and it is expected that it will then start work on development of a proposed American Standard.—*American Institute of Electrical Engineers.*

Railway Motors and Other Rotating Electrical Machinery on Rail Cars and Locomotives (C35)—

A revision of the American Tentative Standard on Railway Motors (C35-1937) is now before the American Standards Association for approval.*—*American Institute of Electrical Engineers.*

Circuit Breakers (C37)—

A proposed American Standard for A-C Power Circuit Breakers was published for a year's trial use in January, 1941. Proposed changes in this draft have now been considered and only editorial work remains to be done before the final draft is submitted for approval first by the sub-committee in charge and then by the sectional committee. A proposed standard on air switches (C37.3) is also being prepared. Work of the committee on high-voltage fuses and current-limiting resistors, switchgear assemblies, metal enclosed switchgear, and apparatus bushings has been deferred awaiting outcome of work being done by committees of the American Institute of Electrical Engineers. The AIEE now has a publication on switchgear assemblies, AIEE 27. Projects on large air circuit breakers, power connectors, and network protectors are inactive.—*H. R. Summerhayes, Chairman; G. S. Lunge, Secretary.*

Electrical Measuring Instruments (C39)—

An American War Standard on electrical indicating instruments (C39.1-1942) has just been approved by ASA for equipment used by the armed services.

Courtesy Westinghouse

Each hairspring used in electrical indicating instruments is carefully tested.

Storage Batteries (C40)—

This ASA sectional committee is now working on a revision of the American Standard approved in 1940. There is no recent report on the status of its work, however.—*American Institute of Electrical Engineers.*

Definitions of Electrical Terms (C42)—

The new American Standard Definitions were approved in August, 1941, by the American Standards Association (see article p. 114, INDUSTRIAL STANDARDIZATION, May, 1942). The same standard was also approved as a Canadian Standard in March, 1942. Some 12,500 copies

* Since this report was made, the standard has been approved by the ASA as American Standard C35-1943.

Courtesy Westinghouse

Self-protected distribution transformers on the inspection line.

of the standard have already been distributed. It is planned that the committee will be reorganized in the near future to consider any necessary revisions of the standard.—*American Institute of Electrical Engineers.*

Rolled Threads for Electric Sockets and Bases (C44)—

The status of this work is unchanged since our report last year. At that time we stated that the subject of applying standard tolerances to screw shells after assembly instead of to the gages used in their manufacture was discussed from time to time. The work, however, has never progressed to the extent of preparing a definite proposal for standards.—*American Society of Mechanical Engineers; National Electrical Manufacturers Association.*

Electric Railway Control Apparatus (C48)—

This committee was not active during the year.—*American Institute of Electrical Engineers.*

Rotating Electrical Machinery (C50)—

A revision of the 1936 edition is now out to letter ballot of the sectional committee. A considerable number of changes have been made in the new edition recognizing practices which have developed since 1936.—*L. F. Adams, Chairman; E. B. Paxton, Secretary.*

Capacitors (C55)—

The committee has been inactive this past year.—*American Institute of Electrical Engineers.*

Transformers (C57)—

The proposed standards which were printed in 1940 for a period of trial use have been revised in light of the experience gained during the trial period. The new standards have been approved by the ASA. This concludes a number of years of extensive work by the committee and makes available comprehensive standards for transformers, regulators, and reactors and also Recommended Practices covering a Test Code for Transformers and a Guide for Operation of Transformers and Regulators.—*V. M. Montsinger, Chairman; E. B. Paxton, Secretary.*

Electrical Insulating Materials (C59)—

The sectional committee has taken action to submit three ASTM standards to the ASA as soon as ASTM Committee D-9 acts on their revision. A special committee of the sectional committee is reviewing the proposed revisions. These three standards are:

ASTM Standard Methods of Testing:

Sheet and Plate Materials Used in Electrical Insulation (D 229)
Laminated Tubes Used in Electrical Insulation (D 348), and
Laminated Round Rods Used in Electrical Insulation (D 349)

The ASTM revision of Methods of Testing Electrical Insulating Oils (ASTM D 117-40), the original edition of which had been approved by the ASA in 1941, is now being considered by a special committee of the sectional committee for submittal to the ASA.

In accordance with action taken by the committee at its meeting in February, the NEMA Manufactured Electrical Mica Standards, recommended for submittal to the ASA, have been referred to Subcommittee IX on Mica Products of ASTM Committee D-9 for consideration.

The following NEMA standards, proposed for submittal to the ASA, are still being considered by a special reviewing committee of sectional committee C59:

NEMA Laminated Phenolic Products Standards, and
NEMA Recommended Practice for Machining and Punching of Laminated Phenolic Plates

A special committee reviewed four ASTM standards on shellac to determine whether these standards are acceptable so far as their electrical uses are concerned. This action was taken on recommendation of ASTM Committee D-1 on Paint, Varnish, Lacquer, and Related Products.

As a result of the special committee's work, the sectional committee has referred three of the standards to Committee D-1 with the suggestion that the scope of each be limited to indicate that they do not cover shellac intended for use as an electrical insulation material. These three standards are:

ASTM Standard Specifications for:

Dry Bleached Shellac (D 207-35)
Orange Shellac (D 237-41)
Shellac Varnishes (D 360-41)

In addition, the committee recommended that a cross reference be inserted in ASTM Standard Methods of Sampling and Analysis of Shellac (D 29-40) calling attention to additional tests needed in testing shellac for electrical uses. These additional tests are given in ASTM Methods of Testing Shellac Used for Electrical Insulation (D 411-42). The methods of test outlined in Standard D 411-42 are now being considered by a special subcommittee.

As a first step toward compiling a library of available standards for electrical insulating materials to be deposited in the office of the committee secretary, a preliminary list has been prepared. This list will be reviewed and any desirable additions or corrections made. When duplicate or conflicting standards are found, it will be desirable that specifications be harmonized and a single national standard be developed. Gaps may also be found where standards are still needed. It is hoped that this list will be useful as a guide in the activities of the committee.

In view of the shortage of critical materials, the committee has been interested in a study of synthetic and new materials. A special group has been appointed to consider a broader field of products, such as cellulose acetate, polyvinyl chloride, polyvinyl acetate, etc.

The committee is now considering preparing a handbook covering the properties of insulating materials, particularly electrical properties, and hopes to carry it forward during the coming year.—*American Society for Testing Materials.*

Vacuum Tubes (C60)—

The chairman expects to call a meeting of the committee at an early date to initiate the committee's work.—*Dayton Ulrey, Chairman; J. B. Russell, Secretary.*

Lightning Arresters (C62)—

A revision of the American Standard approved in 1936 is now before the American Standards Association for action.—*American Institute of Electrical Engineers.*

Radio-Electrical Coordination (C63)—

No activity has been reported by this committee.—*Radio Manufacturers Association.*

Carbon Brushes (C64)—

A sectional committee has been organized to handle some changes in the American Standard for Graphite and Metal-Graphite Carbon Brushes (C64-1935). The proposed changes are now being considered by the sponsor. —*National Electrical Manufacturers Association.*

Power-Operated Radio Receiving Appliances (C65)—

A revised edition of this standard originally approved in 1938 has now been completed.*—*Underwriters' Laboratories.*

Electrical Installations on Ships (C66)—

A committee is to be organized on this subject to work on recommendations for the International Electrotechnical Commission when required.

Preferred Voltages, 100 Volts and Under (C67)—

It is expected that a new chairman will be appointed for this committee.—*C. M. Cogan, Secretary.*

Sphere Gap Standardization (C68)—

A revision of AIEE standard No. 4 "Measurement of Test Voltages in Dielectric Tests" has been submitted to the ASA for action.—*American Institute of Electrical Engineers.*

Electric Fences (C69)—

No report has been received from this committee.—*National Bureau of Standards.*

Domestic Electric Flatirons (C70)—

A preliminary draft of a proposed standard will be submitted to this committee soon.—*National Electrical Manufacturers Association.*

Household Electric Ranges (C71)—

A preliminary draft of a proposed standard will be submitted to this committee soon.—*National Electrical Manufacturers Association.*

Electric Water Heaters (C72)—

It is expected that a proposed standard will be ready for submittal to this committee soon.—*National Electrical Manufacturers Association.*

Attachment Plugs and Receptacles (C73)—

No suggestions for revision of the standard approved in 1941 have been received.—*C. M. Cogan, Secretary.*

Standards for Locomotives for Coal Mines (M25)—

A sectional committee was organized by the American Standards Association to cover this subject in 1940, but no report has been received recently on its activities.—*American Institute of Electrical Engineers, National Electrical Manufacturers Association, American Mining Congress.*

Wood Poles (O5)—

Special subcommittees have been organized to study the American Standard Specifications for Western Red Cedar Poles and the Specifications for Southern Pine Poles, as well as to consider enlarging the scope of the sectional committee. Because of the present emergency conditions, however, action by these special subcommittees has been suspended until further notice.—*ASA Telephone Group.*

Letter Symbols and Abbreviations for Science and Engineering (Z10)—

Letter Symbols for Hydraulics (Z10.2) and Letter Symbols for Mechanics of Solid Bodies (Z10.3) were approved as American Standard in 1942. The committee is also now at work on other standards.—*American Institute of Electrical Engineers, American Society of Mechanical Engineers, Society for the Promotion of Engineering Education, American Association for the Advancement of Science, American Society of Civil Engineers.*

Graphical Symbols and Abbreviations for Use on Drawings (Z32)—

Two revised standards, submitted recently to the American Standards Association, have now been approved:

Welding Symbols and Instructions for Their Use (Z32.1)

Graphical Symbols for Telephone, Telegraph, and Radio Use (Z32.5)

An article in the November issue of INDUSTRIAL STANDARDIZATION, page 269, describes this latter standard.

Two other standards have been submitted to the ASA:

Graphical Symbols for Electric Power Control and Measurement (Z32.3)

Electrical Symbols for Architectural Plans (Z32.9) —*American Institute of Electrical Engineers; American Society of Mechanical Engineers.*

Copper Wire (H4)—

Two standards were approved during the year:

Specifications for Soft or Annealed Copper Wire (H4.1-1942; ASTM B3-41)

Hot Rolled Copper Rods for Electrical Purposes (H4.7-1942; ASTM B49-41)—*American Society for Testing Materials.*

Household Refrigerators (B38)—

Two draft standards are out to letter ballot of committee B38.—*American Society of Refrigerating Engineers; Bureau of Home Economics.*

Courtesy General Electric

Part III of the Code for Protection Against Lightning is now nearing completion.

* See page 17.

OPA Requires Labels On Six Consumer Commodities

AN understanding of labels on goods is becoming increasingly important as the stocks of civilian goods diminish, the Office of Price Administration pointed out recently. Labeling has been made compulsory on six commodities: beef and veal; nylon hosiery; men's work clothes; women's work clothes; underclothing; and bed linens.

These commodities have been added to those previously under Federal or State labeling laws, the OPA explained, because their quality is most likely to be influenced by shortages of one kind or another. The enforced labeling is expected to enable consumers to detect any lowering of quality and prevent waste of critical materials.

The marking of beef and veal affects the consumer only indirectly. Carcasses sold in the wholesale market must be marked AA for choice quality; A for good quality (which includes most of the better grades widely bought by housewives); B for commercial grade; and C for utility. These grades must be marked under the supervision of a U. S. Department of Agriculture inspector.

The labeling of nylon hosiery actually reaches the over-the-counter purchaser. A tag or sticker must be attached to each pair, indicating the gauge and denier of the hose, whether all nylon or only nylon leg, whether irregulars, seconds, or thirds. The word "full fashioned" or its abbreviation must also appear if the hose are full fashioned. If this designation does not appear the hose are circular knit.

On men's work clothes, a label bearing an S, followed by the manufacturer's lot number, indicates that the clothes have been simplified to conform to the War Production Board's work clothing simplification order for conservation of fabric and labor.

All women's work clothes secured with an A-2 priority rating must carry a label specifying that the garment is made for industrial or agricultural workers only, and not for sport or play wear.

Cotton underwear now woven of carded yarn but previously woven of combed yarn will carry a label with the letter R for replacement. Much fine combed yarn has gone into military use. The R may be used on other products eventually.

Bed linens that meet the OPA minimum specifications must bear a label stating type and size, and the word "second" if a second. Bed linens which do not meet minimum specifications must be labelled substandard and indicate the type of cloth and construction.

Standards for Enameled Utensils Will Be Effective in March

The National Bureau of Standards has agreed to extend the effective date for new production of the Commercial Standard for Multiple-Coated Porcelain-Enameled Steel Utensils. The new effective date will be March 30, 1943, instead of September 30, 1942, subject, however, to whether essential raw materials are available at that time. The change was made on the recommendation of the Enameled Utensil Manufacturers Council which explained that priorities and Limitation Orders make it necessary to get steel for enameling from the inventories of manufacturers of other products. The steel acquired so far from these sources has not been suitable for the production of enameled utensils in compliance with the Commercial Standard without serious waste of material and consequent increased cost of production.

In addition the Council declared that the situation with reference to certain chemicals necessary for enameling has changed several times, and the future supply is uncertain. The labor situation also, the Council explained, makes it increasingly difficult to maintain trained forces necessary for the production of enameled utensils according to the standard.

FDA Authorizes Use of Chemicals To Keep Canned Peas Green

As a means of retaining a fresh green color in canned peas, the U. S. Food and Drug Administration has amended its standard of identity to permit the use of sodium carbonate, calcium hydroxide, and magnesium hydroxide. These chemicals will serve to alkalize the peas. The green color of peas is due to chlorophyll, which changes to pheophytin after the peas have been picked from the vines. This process is hastened by the naturally acid state of the peas, accentuated during the canning process.

It has been found, the Administration explains, that the three alkalis which will now be permitted to be used in the canning process will counteract this acid condition and prevent undue loss of chlorophyll. Extensive investigations of the effects of these alkalis has failed to show any harmful effects upon the nutritive value of canned peas, the Administration reports. However, the use of these chemicals without informing the purchasers would not promote honesty and fair dealing in the interest of consumers, it declares, and therefore the Administration requires that the label shall bear the statement "Traces of sodium carbonate, calcium hydroxide, and magnesium hydroxide added," or "Traces of alkalis added."

Standard Tests and Specifications In WPB and OPA Orders

IN many of the War Production Board and Office of Price Administration orders, standards play an important part, either through reference to existing standards or through standards or simplification schedules set up in the order itself. Such standards form the basis for control of production, conservation of materials, or for control of prices. The following orders have the effect of setting up standard specifications, tests, grades, or simplification schedules.

War Production Board

Airport Lighting Equipment (General Limitation Order L-235)—

Only "approved airport lighting equipment" shall be manufactured or assembled. Such equipment conforms to specifications issued by the Aeronautical Board of the United States, approved by joint action of the War and Navy Departments and the Civil Aeronautics Administration, and has been certified by the Aeronautical Board of the United States, or conforms to specifications issued by the Bureau of Aeronautics of the United States Navy Department. Equipment other than "approved airport lighting equipment" is to be produced only on authorization of the Army Air Forces Materiel Center of the War Department of the United States, or by the Bureau of Aeronautics of the U. S. Navy Department, or to meet specifications of the United States Navy Department for use on an aircraft carrier, or upon written request as specifically authorized by the Director General for Operations.

Asbestos Textiles (Conservation Order M-123 as Amended Dec. 14, 1942)—

Asbestos textiles for use in manufacturing items on List B in this order shall not contain a greater percentage of asbestos than underwriter's grade as defined in paragraph (5)(a) of ASTM standard D 299-37.

Canned and Processed Foods (Conservation Order M-86, as amended December 9, 1942)—

Authorizes the Director General of Operations to allocate canned or processed foods to any government agency, and for Lend-Lease, and gives him authority to issue specifications at any time as to processing, packing, containers, container treatment, can marketing, labeling, boxing, and strapping. Also gives the Director General authority to have such canned foods inspected and graded.

Supplementary Order M-86-e—

Lists preferences in type, style, variety and can size of canned fruits and vegetables to be set aside for the government. Allocates the quotas prescribed in the order to the Army of the United States to purchase for its own account and the account of other government agencies whenever it has agreed with such other agencies to do so. The Army and the Agricultural Marketing Administration in the U. S. Department of Agriculture are authorized to inspect and grade these canned foods.

Chemical Fertilizers (Conservation Order M-231 as amended December 4, 1942)—

Chemical Nitrogen—

Standardizes the method of expressing the grade of chemical fertilizer and defines grades as the minimum guaranteed plant food content of any fertilizer expressed in percentages of its principal plant food components. In expressing grades the percentage of nitrogen content is stated first, the percentage of available phosphoric acid is stated second, and the precentage of water-soluble potash is stated third.

Schedule B lists approved grades (stated on a nitrogen content basis or on a crop basis) which may be substituted during 1942-1943 for grades used in 1940-1941. Only those grades listed as corresponding to a specific 1940-1941 grade may be used as a substitute for the earlier grade and no other grades may be used for the crops to which they are assigned. The grade of 3-8-7 is assigned for use on victory gardens and is to be labeled "Victory Garden Fertilizer."

Dry Cell Batteries and Portable Lights Operated by Dry Cell Batteries (Supplementary Limitation Order L-71-a)

Hearing Aid Batteries

Hearing aid batteries for carbon type hearing aid devices shall contain either two or three cells not smaller than the cell designated "CD" in Table 1 of American Standard Specification for Dry Cells and Batteries (Circular C435 of the National Bureau of Standards). Each "B" type hearing aid battery shall contain as terminals plug-in sockets having the terminal arrangement shown in III in Figure 1 of the American Standard. Each "A" hearing aid battery shall contain as terminals either plug-in sockets having the terminal arrangement shown in IV in Figure 1, or flashlight cell type terminals as described in Section 11.4 of the American Standard.

Electrical Conduit, Electrical Metallic Tubing and Raceways (General Limitation Order L-225)—

Rigid electrical conduit, sizes ¼ in. to 2 in. inclusive, may not be installed in a building unless the National Electrical Code establishes the use of such conduit as a minimum acceptable standard method of wiring in Class I, II, III, and IV hazardous locations. Sizes 2½ in. to 6 in. shall not be installed unless the wires must be protected from mechanical injury for safety reasons, or the installation is made in damp or wet locations as defined in the 1940 edition of the National Electrical Code; or the National Electrical Code establishes its use as a minimum acceptable standard method of wiring in Class I, II, III, and IV hazardous locations. Electrical metallic tubing must also only be used under certain conditions, one of which is to enclose electric wire or cable in damp or wet locations as defined in the National Electrical Code.

Farm Machinery and Equipment and Attachments and Repair Parts Thereof (Limitation Order L-170 as amended November 25, 1942)—

Includes a section on standardization, simplification, substitution, and conservation of critical materials providing that in the manufacture of any item of farm machinery and equipment or repair parts, no producer shall use any alloy steel, stainless steel, aluminum, magnesium, copper, brass, bronze, zinc, nickel, tin, cadmium, or fabricated rubber products for any purpose where the use of other less critical materials will not impair the efficiency of operation of such item.

Amended to provide that no materials shall be used which are prohibited by M-Orders or other restrictions on use of critical materials ordered by the Director General for Operations.

Authorizes Director General for Operations to issue supplementary orders or schedules establishing required specifications for farm machinery and equipment and repair parts. Required specifications may include requirements to standardize or simplify the types, sizes, or model of, or the specifications for, any such item or items; eliminate, reduce, or conserve the use of critical materials; and substitute less critical materials.

Glass Container and Closure Simplification (Schedule E to Limitation Order L-103)—

Glass Containers for Protective Coatings—

Defines a "standard glass container for protective coatings" as one meeting requirements of the Glass Container Association's standards for finish, and which is interchangeable therewith without alteration of the body mold. Limits the use of standard glass containers with a finish larger than 38 mm. Molds for glass containers may not be replaced except by a mold which conforms to the standard specifications. Drawings for standard glass containers for paint are included in the order.

Hardware Simplification (Limitation Order L-236)

Builders' Finishing Hardware (Schedule I)—

Establishes sizes, types, grades, weights, and finishes for the manufacture of builders' finishing hardware. On and after January 15, 1943, no builders' finishing hardware which does not conform to these specifications shall be placed in production and after March 1 no producer shall assemble or complete from component parts in inventory any builders' finishing hardware unless it conforms to the sizes, types, grades, finishes, weights, and standards established in this Schedule. Builders' finishing hardware includes all mechanical devices for supporting, guarding, operating, controlling, or securing doors, windows, drawers, gates, etc.

Iron and Steel

Tin Plate, Terne Plate and Tin Mill Black Plate—(Supplementary Order M-21-e, as Amended Dec. 11, 1942)—

Specifies the maximum permitted coating of tin or of terne metal and lists the materials which may now be used in manufacturing a selected list of products, such as cans, closures, baking pans for commercial bakers, cheese vats, gas mask canisters, gas meters, etc.

Tool Steel—(Supplementary Order M-21-h)—

Specifies the percentage of different materials to be used in different grades of "Class A" and "Class B" high-speed steel. Other alloying elements may be present in the high-speed steels of either class, but steel not containing the elements named, in the amount specified, shall not be deemed high-speed steel.

Material Entering into the Production of Automotive Tire Chains and Chain Parts (Limitation Order L-201 as Amended December 5, 1942)—

Limits production of tire chains or chain parts, except for certain tire sizes specified, to the types designated A, C, G, and M in Tire Chain Specifications No. 7140, copyrighted by the Chain Institute, Inc. Also limits the amount of metal used in the production of such chains.

Plumbing and Heating Tanks (Limitation Order L-199)—

Limits production to six sizes of boilers meeting the specifications given in this order. Inside diameter, length of shell, nominal capacity, tappings, maximum working pressure (standard and extra heavy) are specified. The specifications call for welded seams only, no hand holes and manholes or inspection tapping. Four sizes of expansion tanks are permitted, meeting specifications outlined in the order.

Plywood (Limitation Order L-150-b)

Hutment Grade Plywood—

Panels must be capable of passing the test for moisture-resistant type plywood, as set forth in Commercial Standard CS 45-42, issued by the National Bureau of Standards, except that samples shall be subjected to ten cycles consisting of seven hours of soaking and seventeen hours of drying. The veneers used shall be equivalent to Sound one side grade of exterior type, as specified in Commercial Standard CS 45-42, and workmanship and tolerances not otherwise provided for shall conform to industry practices as set forth in Commercial Standard CS 45-42.

Portable Tools, Chucking Equipment, Mechanics' Hand Service Tools, Files, Hack and Band Saws, Vises, Machine Tool Accessories (Schedule I to Universal Portable Electric Tools Limitation Order L-216)—

Provides simplification schedules for drills, right angle buffers, sanders, and polishers; saws; grinders.

Rubber and Balata and Products and Materials of which Rubber or Balata is a Component (Supplementary Orders M-15-b and M-15-b-1 as amended December 28, 1942)—

This revised order sets up complete specifications for the manufacturer of 31 classes of products. Numerous changes have been made in these regulations in the new edition and the WPB advises manufacturers to study the revised order thoroughly. The new regulations took effect January 1, 1943. The changes in M-15-b are designed to reduce unnecessary paper work, to clarify certain definitions, and to correct other minor points.

Safety Equipment (Limitation Order L-114 as amended November 27, 1942)—

Provides that no aluminum, asbestos cloth, chromium, copper, copper base alloys, nickel, corrosion-resisting steel, alloy-steel, tin, synthetic plastics, magnesium, rubber or synthetic rubber, or neoprene shall be used in safety equipment, except as provided in the appendices.

Zinc (Conservation Order M-11-b- as amended November 26, 1942)—

Prohibits the use of zinc in articles listed. Defines "prime western zinc" as zinc of no higher grade than that conforming to ASTM specifications B6-37 grade 5 and zinc dust for Sheradizing. "Zinc of any other grade" means zinc conforming to ASTM specification B6-37 grades 1a, 1, 2, 3, or 4, and any alloy in the composition of which the percentage of zinc metal by weight equals or exceeds the percentage of all other metals.

Office of Price Administration

Apparel (Maximum Price Regulation 208, Amendment 2)—

Staple Work Clothing—

Adds Appendix B on Simplification of Work Pants, eliminating cuffs on trousers made of material of the weight of 2.50 yards per pound on 30 in. grey weight basis, or heavier.

Containers (Revised Maximum Price Regulation 55)

Second Hand Bags—

Lists widths, lengths, quality of material in ounces per yard for second hand burlap and cotton bags and bags of special types. Prices are based on these lists of sizes.

Household Furniture (Revised Maximum Price Regulation 213)—

Coil and Flat Bedsprings with Non-Steel Frames—

Sets prices for this type of bedsprings on the basis of Classes A through L and includes specifications for each Class. The specifications cover number and type of coils, gauge and kind of coil wire, and of border wire, size and kind of wood in side rails, and numbers, size, and kind of wood for cross members. Weight of wire is specified for each class.

Lumber and Lumber Products (Revised Maximum Price Regulation 109)—

Aircraft Lumber—

Provides maximum prices for aircraft lumber meeting requirements of Army-Navy aeronautical specifications: Sitka spruce (AN-S-6); red spruce (AN-S-6); white spruce (AN-S-6); Noble Fir (AN-F-6); western hemlock (AN-H-4). Grade terms used in the tables refer to specifications established by the U. S. Treasury Department Procurement Division, and those issued by the National Hardwood Lumber Association and adopted by WPB.

Specifications are also included for rough, green aircraft lumber for aero recovery grades; and for rough, green aircraft lumber conforming to U. S. Treasury Department Procurement Division specifications.

Rubber and Products and Materials of Which Rubber Is a Component (Maximum Price Regulation 220, Amendment 2)—

Certain Rubber Commodities—

Defines "synthetic rubber" as a material obtained by chemical synthesis, possessing the approximate physical properties of natural rubber, when compared in either the vulcanized or unvulcanized condition, which can be vulcanized with sulphur or other chemicals with the application of heat, and which, when vulcanized, is capable of rapid elastic recovery after being stretched to at least twice its length at temperatures ranging from 0 F to 150 F at any humidity.

Softwood Lumber Products (Revision of Maximum Price Regulation 13)—

Douglas Fir Plywood—

This regulation covers sales of all grades and sizes of Douglas fir plywood. All the grade terms, other than "Sound 1 Side Plypanel" refer to standards of the U. S. Department of Commerce, National Bureau of Standards, Commercial Standards CS 45-40 (Douglas Fir Plywood, Domestic Goods).

NFPA Permits Emergency Use of Wood in Paint Spraying

The National Fire Protection Association announces that as an emergency measure its Committee on Finishing Processes has unanimously agreed to permit wooden fans or fan blades impregnated with a fireproofing chemical compound for paint spraying and spray booths. Fans made of other slow-burning material such as plastics may also be accepted.

ASTM Issues Standards On Textile Materials

The 1942 compilation of the ASTM Standards on Textile Materials gives in their latest form each of the 73 standards on textile materials as developed through the work of Committee D-13 on Textile Materials of the American Society for Testing Materials. In addition to the specifications and tests, other related information is given in the book including a 15-page section on photomicrographs of common textile fibers, information on basic properties, yarn number conversion table, table for relative humidity, an important glossary of terms relating to textile materials which includes a discussion with illustrations of defects in woven fabrics.

There are also abstracts of three recent papers involving statistical methods or technique in testing as related to this field.

Of the 73 specifications and tests, 19 cover cotton and cotton goods, nine cover rayon, and ten are on wool. Others have to do with asbestos, glass, and miscellaneous materials such as single jute yarn, jute rove and plied yarn (electrical purposes), lime for textile purposes, household blanketing, and electrical insulation (thickness). Sixteen of the standards are general in nature covering testing machines, fibers (identification and determination), fire-retardant properties, evaluating compounds for insect resistance, resistance to water, finishes on textiles (identification), and resistance to microorganisms.

Several of the standards have received ASA approval. Among these are the Standard Methods of Testing Wool Felt, Standard Methods of Testing and Tolerances for Tubular Sleeving and Braids, and Shrinkage in Laundering of Woven Cotton Cloth.

Committee D-13 has endorsed the method of designating colors developed by the Inter-Society Color Council at the National Bureau of Standards, commonly referred to as the ISCC-NBS method, as a means of promoting uniformity of nomenclature in presenting textile color data. The American War Standard on Color is included as an Appendix to this book.

Copies of this 440-page publication can be obtained in heavy paper cover from the American Society for Testing Materials, 260 S. Broad Street, Philadelphia, at $2.25 each.

ASA Standards Activities

Standards Available Since Our December Issue

Code for Pressure Piping American Standard B31.1-1942 $2.00

Manhole Frames and Covers for Subsurface Structures American Standard A35.1-1941 35¢

Marking Compressed Gas Cylinders to Identify Content American Standard Z48.1-1942 10¢

Wire and Cable Specifications

Cotton Braid for Insulated Wire and Cable American Standard C8.12-1942 25¢

Metallic Coverings for Insulated Wire and Cable American Standard C8.15-1942 25¢

Slow-Burning Wire and Cable (supersedes C8k2-1932) American Standard C8.9-1942 25¢

Varnish Cloth Insulation for Lead-Covered or Braid-Covered Power Cable American Standard C8.13-1942 50¢

Standards Approved Since Our December Issue

Allowable Concentration of Chromic Acid and Chromates American Standard Z37.7-1943

Allowable Concentration of Mercury American Standard Z37.8-1943

Alloy-Steel Castings for Structural Purposes (ASTM A148-42) American Standard G52.1-1943

Alloy-Steel Castings for Valves, Flanges, and Fittings for Service at Temperatures from 750 to 1100 F (ASTM A157-41) American Standard G36.1-1942 (Revision of May 20, 1942 edition)

Carbon-Steel Castings for Miscellaneous Industrial Uses (ASTM A27-42) American Standard G50.1-1943

Standards Approved—(Continued)

Carbon-Steel Castings Suitable for Fusion Welding for Miscellaneous Industrial Uses (ASTM A215-41) American Standard G51.1-1943

Central Heating Gas Appliances, Requirements for American Standard Z21.13-1943

Cranes, Derricks, and Hoists, Safety Code American Standard B30.2-1943

Prevention of Dust Explosions, Safety Codes

Country Grain Elevators American Standard Z12.13-1943

Grain Elevators and Storage Units, Suggested Good Practices for the Application of Suction and Venting for the Control of Dust American Standard Z12.14-1943

Inert Gas for Fire and Explosion Prevention, Use of American Standard Z12.10-1943

Sulphur Dust Explosions and Fires American Standard Z12.12-1943

Rivets

Small Rivets American Standard B18a1-1942 (Addendum to B18a-1927)

Tinners', Coopers', and Belt Rivets American Standard B18g1-1942 (Addendum to B18g-1928)

Rotating Electrical Machinery on Railway Locomotives and Rail Cars and Trolley, Gasoline-Electric and Oil-Electric Coaches American Standard C35-1943

Textile Testing Machines, Specifications for (ASTM D76-41) American Standard L15.1-1943

Standards Approved—(Continued)

Zinc
- Rolled Zinc (ASTM B69-39) American Standard H24.1-1943
- Slab Zinc (Spelter) (ASTM B6-37) American Standard H25.1-1943

Standards Reaffirmed

Prevention of Dust Explosions, Safety Codes
- Aluminum Bronze Powder, Manufacture of American Standard Z12.11-1943
- Coal Pneumatic Cleaning Plants American Standard Z12.7-1943
- Flour and Feed Mills American Standard Z12.3-1943
- Pulverized Fuel Systems American Standard Z12.1-1943
- Spice Grinding Plants American Standard Z12.9-1943
- Starch Factories American Standard Z12.2-1943
- Sugar and Cocoa American Standard Z12.6-1943
- Terminal Grain Elevators American Standard Z12.4-1943
- Wood-Flour Manufacturing Establishments American Standard Z12.8-1943
- Woodworking Plants American Standard Z12.5-1943

Standards Being Considered by ASA for Approval

Cast-Iron Pipe Flanges and Flanged Fittings, Class 250 (Revision of B16b-1928)
Cold-Rolled Strip Steel (ASTM A109-38) G47
Colored Textiles, Fastness L14
Engineering and Scientific Graphs for Publication Z15.3
Keyways for Holes in Gears B6.4
Lime
- Limestone, Quicklime, and Hydrated Lime, Methods of Chemical Analysis of (ASTM C25-29)
- Quicklime for Structural Purposes, Specifications for (ASTM C5-26)

Markings for Grinding Wheels B5.17
Threaded Cast-Iron Pipe for Drainage, Vent, and Waste Services

Standards Submitted for Consideration Since Our December Issue

Graphical Electrical Symbols for Architectural Plans Z32.9
Graphical Symbols for Power, Control and Measurement Z32.3

American War Standards

Standards Approved and Published

Accuracy of Engine Lathes B5.16-1941 25¢
Allowable Concentration of Cadmium Z37.5-1941 20¢
Code for Electricity Meters (Revision of Paragraph 827) C12WS-1942 10¢
Color, Specification and Description of Z44-1942 25¢
Domestic Gas Ranges, Approval Requirements Z21.1ES-1942 $1.00
Fixed Mica-Dielectric Capacitors C75.3-1942 50¢
Gas Water Heaters, Approval Requirements Z21.10WS-1942 $1.00
Machine Tool Electrical Standards C74-1942 40¢
Manganese, Allowable Concentration of Z37.6-1942 20¢
Photographic Exposure Computer Z38.2-1942 $1.00
Protective Lighting for Industrial Properties A85-1942 50¢
Quality Control
- Guide for Quality Control Z1.1-1941
- Control Chart Method of Analyzing Data Z1.2-1941

(In one Volume 75¢)
- Control Chart Method of Controlling Quality During Production Z1.3-1942 75¢

Straight Screw Threads for High-Temperature Bolting B1.4-1942 25¢

War Standards Approved and Published Since Our December Issue

Electrical Indicating Instruments (2½ and 3½ Inch, Round, Flush-Mounting, Panel-Type) C39.2-1943 30¢
Men's Safety-Toe Work Shoes, Specifications for Z41.1-1943 20¢

Standards Under Way

Allowable Concentration of Xylene Z37
Allowable Concentration of Xylol Z37
Children's Sizes L11
Class 125 Cast-Iron Flanged Fittings B16a
Color Code for Lubricants for Machinery Z47
Goggles and Respiratory Equipment, Standardization and Simplification of

Standards Under Way—(Continued)

Military Radio Equipment and Parts C75

1-2. Insulating Materials
- (a) Ceramics
- (b) Steatite
- (c) Porcelain
- (d) Glass
- (e) Glass-Bonded Mica
- (f) Treating, Filling, and Impregnating
- (g) Plastics
- (h) Plastic Communications Components

3. Capacitors—Fixed
- (a) Ceramic Dielectric
- (b) Paper Dielectric
- (c) Electrolytic

4. Capacitors—Variable
- (a) Receiver
- (b) Transmitter
- (c) Trimmer

5. Dynamotors and Similar Power Units

6. Crystals and Holders
- (a) Physical Characteristics
- (b) Specifications and Testing
- (c) Reference Test Circuits

7. Resistors—Fixed
- (a) Composition
- (b) Wire Wound
- (c) Instrument Type

8. Resistors—Variable
- (a) Composition
- (b) Wire Wound

9. Transformers
- (a) Power
- (b) Audio Frequency
- (c) Radio Frequency

10. Tube Sockets
- (a) Receiving
- (b) Transmitting
- (c) Cathode Ray

11. Connectors
- (a) Telephone Plugs and Jacks
- (b) Multicontact Plugs and Receptacles

12. Dry Batteries
- (a) Single Cell
- (b) Multicell

13. Vibrator Power Supplies

Packages for Electronic Tubes Z45
Pressure-Temperature Ratings for Steel Pipe Flanges and Flanged Fittings B16e5
Protective Occupational Footwear Z41
- Conductive Work Shoes, Men's
- Electrical Hazard Shoes, Men's
- Explosives Operations (Powder) Shoes, Men's
- Molders Safety-Toe Shoes. Men's
- Women's Safety-Toe Shoes

Replacement Parts for Civilian Radio
Threading of General Purpose Nuts and Bolts B1
Welding Arc Hand Shields and Helmets

New Projects Approved

Acme Screw Threads for Aircraft B1

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American Standard Code for Pressure Piping B31.1-1942

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